

THE IRON AGE

A Review of the Hardware, Iron, Machinery and **ades.**

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. 69: No. 12.

New York, Thursday, March 20, 1902.

\$5.00 a Year, including Postage.
Single Copies, Ten Cents.

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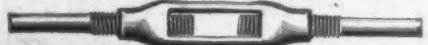
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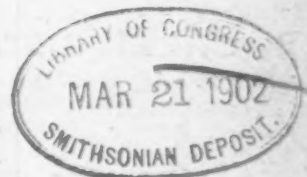
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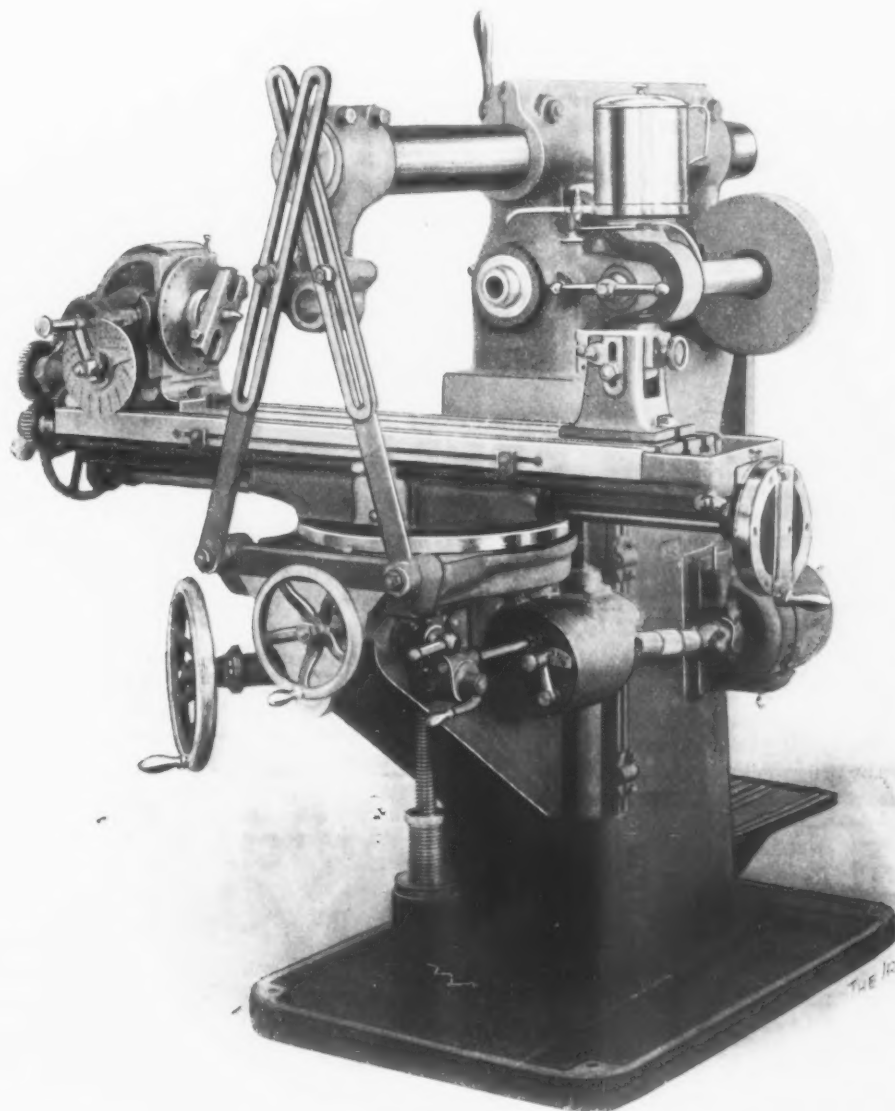
THE IRON AGE

THURSDAY, MARCH 20, 1902

New Brown & Sharpe Universal Milling Machine.

The Brown & Sharpe Mfg. Company of Providence, R. I., have placed upon the market a universal milling machine which embodies many new features of interest. One that attracts attention is the entire absence of the usual feed pulleys and belts, thereby eliminating the

The drive is from the main spindle of the machine by chain to the sprocket wheel 1, Fig. 2, that drives the shaft 2. This shaft carries the two main driving gears 3 and 4, the gear 4 running directly upon the shaft and the gear 3 upon the hub of this gear, these in turn being driven by the clutches 5 and 6. The clutches are operated by the lever 7, Fig. 3, which when thrown over against the stop pin



NEW BROWN & SHARPE UNIVERSAL MILLING MACHINE

overhanging brackets and other appurtenances necessary to a belt driven feed.

The variable feeding mechanism being an entirely new feature, a detailed description will be of interest. It is driven from the main spindle of the machine by a chain and sprocket wheels. The gearing of the mechanism itself being spur gears and the drive to the feed clutch gears in the knee being also by spur gears, all with properly arranged bearings, the loss of power by friction is slight, thus making the efficiency unusually high. It is designed to obtain a wide range of feeds, varying in geometrical progression, fully covering all the requirements of modern milling machine practice. The mechanism as a whole is self contained, and care has been taken to insure ease and quickness of manipulation.

8 engages clutch 5 with gear 3, making it the driver and giving the fast series of speeds indicated on table 10; and when in the reverse position, or against stop pin 9, clutch 5 is thrown out and clutch 6 engages gear 4, and the slow series of speeds is obtained. The power is transmitted from either of the gears 3 or 4, Fig. 2, to the intermediate shaft carrying the two sets of gears 11, 12, 13 and 14, 15, 16, which are keyed into position on the shaft and transmit the power to the series of loose gears 17, 18, 19 and 20, 21, 22, that are mounted to run one upon the other, as shown in Fig. 2; the gears 17 and 22 running directly upon the shaft 2a, that transmits the power to the table through the telescopic shaft down at right of the column in Fig. 1. This method of mounting insures long gearing surfaces for each gear, and at the same time gives compactness to the mechanism. As the

gears all rotate in the same direction the motion between the bearing surfaces is a differential one, due to the difference of speeds between the gears.

The variation of feeds is obtained by engaging the different gears of the series 17, 18, 19, &c., Fig. 2, with the shaft 2a. The locking pin disk 23, Figs. 2 and 4, is keyed to the shaft 2a and carries a series of six locking pins, parallel with the shaft, two of which are shown at 24 and 25, Fig. 2, so arranged as to engage the various

one time. The locking pin disk 23 is figured 1, 2, 3, 4, 5, 6 on its periphery to correspond with the feed table; the index disk being plainly marked with a 0 and provided with a series of holes to receive the adjusting pin.

The mechanism may be set for any desired feed by inserting the adjusting pin in any convenient hole in the periphery of the index disk and turning the index disk until the 0 coincides with the number corresponding to the feed required, as indicated by the feed table, removing

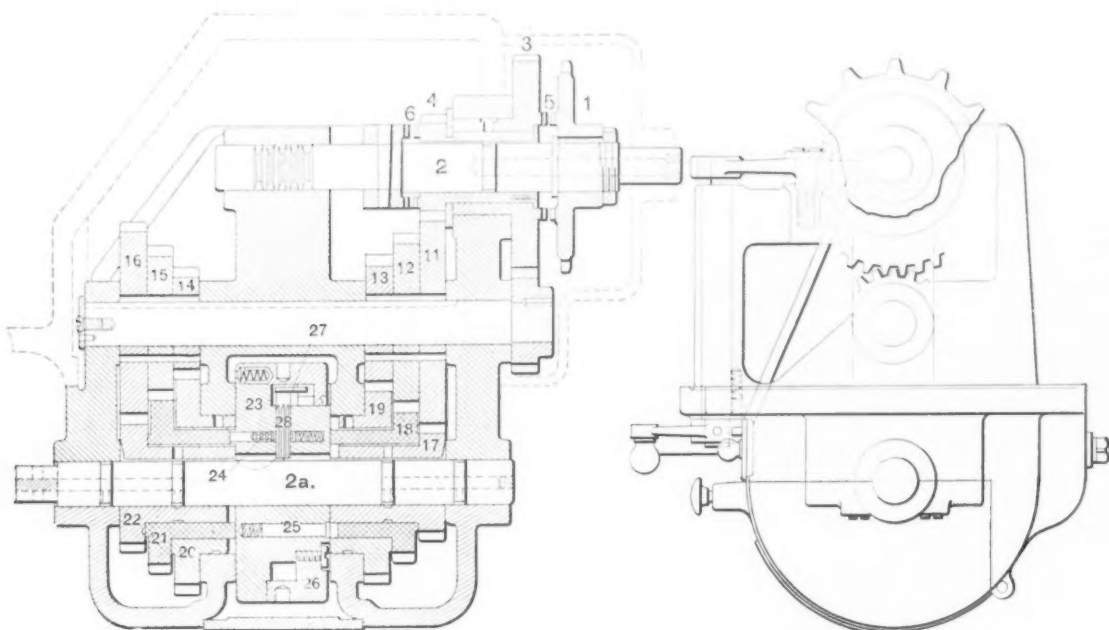


Fig. 2.—Driving Mechanism.

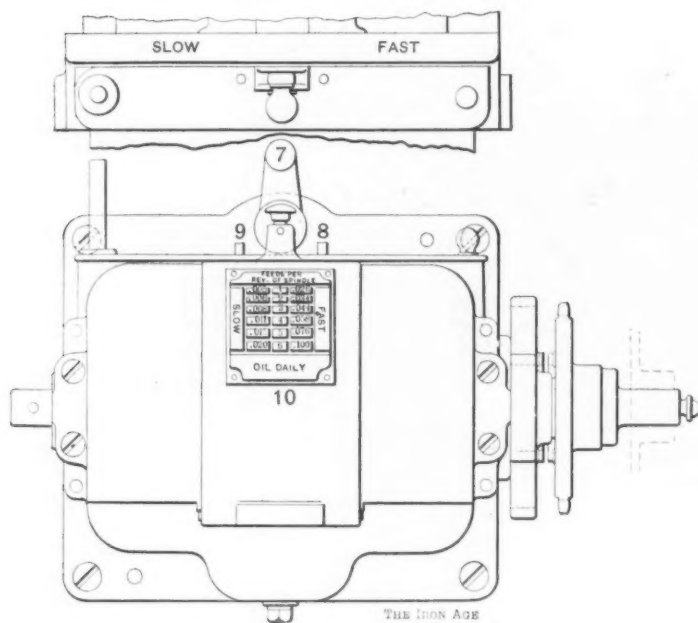


Fig. 3.—Clutch Operating Lever and Index.

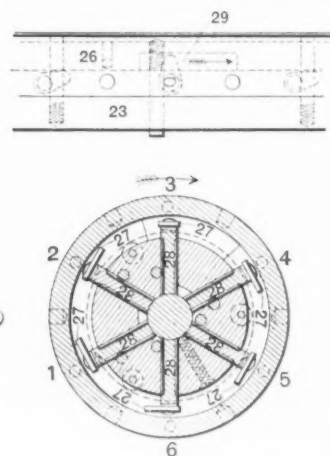


Fig. 4.—Locking Pin Disk.

NEW BROWN & SHARPE UNIVERSAL MILLING MACHINE.

gears of the series, recesses being provided in the hubs of the gears to receive them. The position of these locking pins is controlled by the index disk 26, that turns on the locking pin disk 23 and carries a cam for operating the pinion levers 27, Figs. 2 and 4, fastened to the ends of the small pinions, shown at 28, that engage rack teeth cut in the locking pins. The index disk is provided with a recess, 29, Fig. 4, into which the pinion levers drop and allow the corresponding locking pins to engage the gears; and as there is but one recess in the index disk there is no possibility of engaging more than one feed at

the pin and turning the shaft until locking pin drops into gear. As shown in Fig. 2, the locking pin 24 engages the gear 21, making it the driver for the shaft 2a and giving the No. 3 feed, shown on table 10, Fig. 3, which, with clutch 6 engaged, would be 0.008 inch per revolution of spindle and with clutch 5 0.044 inch. In this case the 0 on index disk 26 would coincide with No. 3 on locking pin disk 23.

The power is transmitted from the variable feed mechanism through the telescopic shaft shown at right in Fig. 1 to the gear case. This case contains the feed

reversing mechanism, which is operated by a lever, the movement of which serves to start, stop or reverse all feeds. The levers shown just in front of this operate respectively the power vertical and the power transverse feeds.

To guard against accidents or breakages, which are inherent in any positively driven mechanism, a safety screw is placed in the telescopic shaft, which is intended to break under any unusual strain and prevent damage to the machine mechanism.

The feed tripping mechanism, shown in Fig. 5, is of the double plunger type, which embodies new features. It can be set to prevent the throwing in of the wrong clutch, and is unusually sensitive. A feature much appreciated is that when the feed is tripped it is not necessary to run the table dog beyond the trip pin to reverse the feed, it being only required to reverse the tripping lever. The two stop pins 30 and 31 control the movement of the lever as follows: The plunger 32 has a recess for receiving the pins, so that when pin 30 is pushed in the lever can be moved only to the left, as the pin will come against the shoulder of the plunger and prevent its moving down; with the pin 31 pushed in, the shoulder at the lower end of the recess comes against the pin and allows the lever to be moved only to the right. When it

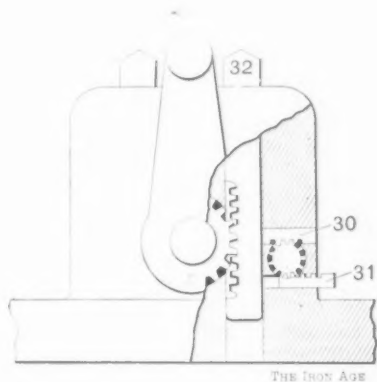


Fig. 5.—Feed Tripping Mechanism.

NEW BROWN & SHARPE UNIVERSAL MILLING MACHINE.

is desired to feed the table in both directions the pins are pushed in until both project an equal distance.

The table is heavy in proportion to the capacity of the machine, and provided with T slots sufficiently deep to insure strength. The arc through which the table can be swung is amply long; for example, on the No. 2 machine this arc is 286 degrees. The power feeds can be used with the table set at any angle to 53 degrees, on the No. 2 machine, either side of zero; this is an exceptionally wide range and greatly increases the capacity of the machine for automatically cutting spirals.

The telescopic knee screw is another important feature, the advantages of which are readily appreciated, as it does not extend below the base, and the machine can be placed at any point upon the floor, regardless of girders or foundations. The thrust of this screw is taken by ball bearings.

The clamping arrangement for the overhanging arm is worthy of attention; it is simple and efficient. One lever, shown at the front of the machine, Fig. 1, operates a shaft with rack teeth that engage the nuts on the clamping bolts, thus clamping both ends of the arm with one movement of the lever. The arm being a straight steel bar makes it possible to place any of the regular attachments in position without the necessity of removing the arm. Arm braces are furnished for tying the arm rigidly.

The arbor support, besides carrying a bronze bushing for the arbor bearing, also carries an adjustable center that is always in position.

The design of this machine throughout shows that great care has been taken to secure the greatest efficiency, together with extreme accuracy and simplicity. The parts are so arranged as to be compact and easy of

access; for example, the feed case is self contained and bolted to the side of the frame. It can be removed as a whole without disturbing any of the other mechanisms. As to the rigidity of the machine, we would call attention to the disposition of the metal, there being no excess where not needed, and when great strength is required the metal will be found to be suitably disposed; for example, the uprights that support the spindle bearings and the overhanging arm are solid and rigidly tied together by a brace forming part of the main casting.

Marine Generating Set.

A marine generating set has been designed by the Holtzer-Cabot Electric Company of Boston to meet a demand for a small and compact set, extreme lightness being especially desired. Aluminum is used very extensively in the construction in portions where great strength is not required. The dynamo is of the multipolar type, the ring and poles being of a high grade of wrought iron selected on account of its high permeability. It is reduced in weight to as great an extent as can be done without interfering with the performance of the machine.

The armature is of the drum wound type and well laminated. It is mounted upon the engine shaft. The brush holders are of the radial type. Self oiling and self aligning bearings are used. The dynamo is in direct connection with a Herreshoff engine of a recent type intended especially for this class of work. It is of the slide valve pattern, with throttling governor. All the working parts are completely inclosed and run in oil. This set weighs 298 pounds and will supply 30 16 candle-power lamps, or 5 watts output per pound of weight, at a speed of 850 revolutions per minute.

Atha Machine Molded Steel Castings.—At the works of the Benjamin Atha & Co., Newark, N. J., a new department has just been added for the production of small machine molded steel castings weighing from 10 to 250 pounds each. The demand for this class of work has been so heavy that this move became necessary. The Newark plant now includes four steel foundries: one operating solely on electric work, one for miscellaneous work, one for heavy castings and the new foundry for machine molded castings. The results obtained from the machine molds is very satisfactory, being remarkably smooth. In the large foundry castings are being produced as heavy as 50,000 pounds. A large amount of work is being done for the New York elevated railroads.

Corundum.—In a review of a pamphlet issued by the Canadian Corundum Company of Toronto, printed in *The Iron Age* of February 27, page 25, an erroneous statement was made that it contained from 20 to 40 per cent. of corundum (free crystalline alumina), the remainder being oxide of iron, silica, &c. As a matter of fact the product is from 95 to 98 per cent. pure.

At the meeting of the New York section of the Society of Chemical Industry, to be held on March 21 at the Chemists' Club, New York, the following papers will be read: A. G. Stillwell, "Graphite in Ores;" Harrison P. Eddy, "The Effect of Pickling Liquids Upon Sewage Treatment;" Alfred J. Cohn, "Blue Print and Black Print Photographic Papers and Their Preparation," and George L. Norris, "Determination of Silicon in Ferro Silicon."

Among a series of monographs issued by the United States Department of Labor, for the exhibit at the Pan-American Exposition of 1901, are the following: Value and Influence of Labor Statistics, by Carroll D. Wright; Present Status of Employers' Liability in the United States and the Protection of Workmen in Their Employment, by Stephen D. Fessenden.

An order for a 5000-ton freight and passenger steamer has been placed with the Roach Shipyard, at Chester, by the New York & Cuba Mail Steamship Company.

Russia and America in the Near East.

BY ALEXANDER HUME FORD.

Having practically captured the commerce of the Far East, Russia and America are suddenly reaching out most energetically for the trade in the near East—Turkey, Persia and Arabia. Both have placed in commission new steamship lines to the Orient. America contemplates still others, while with the breaking up of ice at Odessa in the first year of the new century Russia sent the steamship "Karneloff," with a full cargo, and numerous merchants and engineers to locate in Persian Gulf ports. The "Karneloff" is a steamship on which I have spent many weeks with Russian pioneers; she is well suited for the work in which she is now engaged, and it is probable, hereafter, that much of our goods sent to Persia for transshipment to British vessels at Liverpool or Alden will find its way to the Shah's people via the Russian boats, which will touch at the ports in Turkey with which we have direct steamship communication.

Turkey is no more distant from our Atlantic coast than Japan is from our Pacific ports. Direct steamship communication enables us to send over \$30,000,000 worth of our products to the Japs, or \$10,000,000 less than the value of British goods sent to Turkey. Constantinople is the key to Turkey and beyond, and America, destined to be the leading commercial nation of the twentieth century, cannot afford to neglect its opportunities in Western Asia. From Constantinople radiate the lines of railways which in the coming decade will connect Europe with China, India, Palestine and Egypt. Mile for mile, water transportation is cheaper than rail, so that with a clear waterway to Turkish ports we suffer no disadvantages, unless Germany should charge differential rates on her Asiatic railways, which she naturally will if open door regulations do not forestall any such commercial sharp practice. Nor, without distinct international assurances, could we expect for long better treatment from Russian railroads in Asia, for while Russia is doing all she can to encourage our commerce within her spheres of influence, once she herself becomes a manufacturing nation it is not reasonable to suppose that the nation, traditionally protective, will willingly hand over to us one of the richest prospective markets in the world.

Russian and American interests seem predestined to predominate the near East during the early part of the century, when Russia will be content with territorial conquests, and America with commercial advantages. After that will come the contest for permanent commercial supremacy. Even adjacent European nations will be handicapped in the race, for while they may mark out spheres of influence, Russia alone can pour a steady stream of population into Asia Minor and secure eventual possession. Already her lines from Moscow and St. Petersburg, thanks to a recent outpouring of American capital, cross the Caucasus to Kars, near the Turkish frontier. From this fortified outpost of Russia a railroad is being built on to Erzerum, the central city of Armenia. Russian soldiers now guard this line and the massacre of Armenians by the Kurds doubtless belongs to the past. From Batum on the Black Sea, also connected by iron rails with Moscow, a railroad is now being built to Trebizond, from whence it will proceed along the coast of the Black Sea toward Constantinople. For these railroads Russia expects America to supply the building material, rails and equipment. She will develop Northern Turkey as she is developing Manchuria. Millions of dollars will pour into the country, new cities will spring up in a season and old ones will be Russianized. The surplus population of Southern Russia will find an outlet thousand of miles nearer than the distant Amur region, and, temporarily, American manufacturing interests will benefit, just as they have done in Northern China under the rejuvenating methods of Russia during the past few years. But where Russian influence ends and German begins we can hope for neither advantages nor concessions, and at present the Kaiser seems to have the greater part of Asia Minor close within grasp of his mailed fist. His interest commences at Constantinople,

where begins the railroad system now ending at Angora and Konieh. Until recently this road was under English control, but the British stockholders sold out to the German concessionaires, who are to extend on to the Persian Gulf.

Germany has shown an iron determination to head off all other nations from carrying railroads into Asia Minor. Her first move was to build southward to Konieh, thus heading off both the French and British railroads, proceeding westward from Smyrna, at a single stroke giving Germany the control of the two great distributing ports of Turkey. By surveying her railroads down the valley of the Euphrates Germany gains important strategic and commercial advantages. The English line from Adana has been compelled to surrender, and with the French line from Damascus northward, becomes a mere feeder to the German air line. In the North alone have German plans been thwarted. Coincident with the concession to build railways in Asia Minor, granted by the Sultan to the Dutch Bank in December, 1899, Russia announced her intention of immediately extending her rails from Erzerum to Angora, where they will meet those of the German line. It is needless to say that America will have no part in supplying material for building the German railways in Asia; in fact, contracts have already been given out in the home country for rails and equipment, but as this once richest portion of the world is opened up to modern methods of transportation and an industrious population is poured into the rich but sparsely populated regions, the purchasing power of the country will be increased many fold. Our consuls in the near East, seeing how futile must be our efforts to remain much longer uninvolved in the fate of Turkey, with our foreign commerce assuming such a proportion as to threaten to crowd that of Europe, suggest that we take time by the forelock and build a railroad from Samsun, on the Black Sea, through the richest agricultural portions of Turkey along the banks of the Tigris to Bagdad, following a route made rich in American history by our missionaries, who have established schools and colleges in this region, where thousands of Turkish Christians are receiving a system of education which will fit them for advanced conditions.

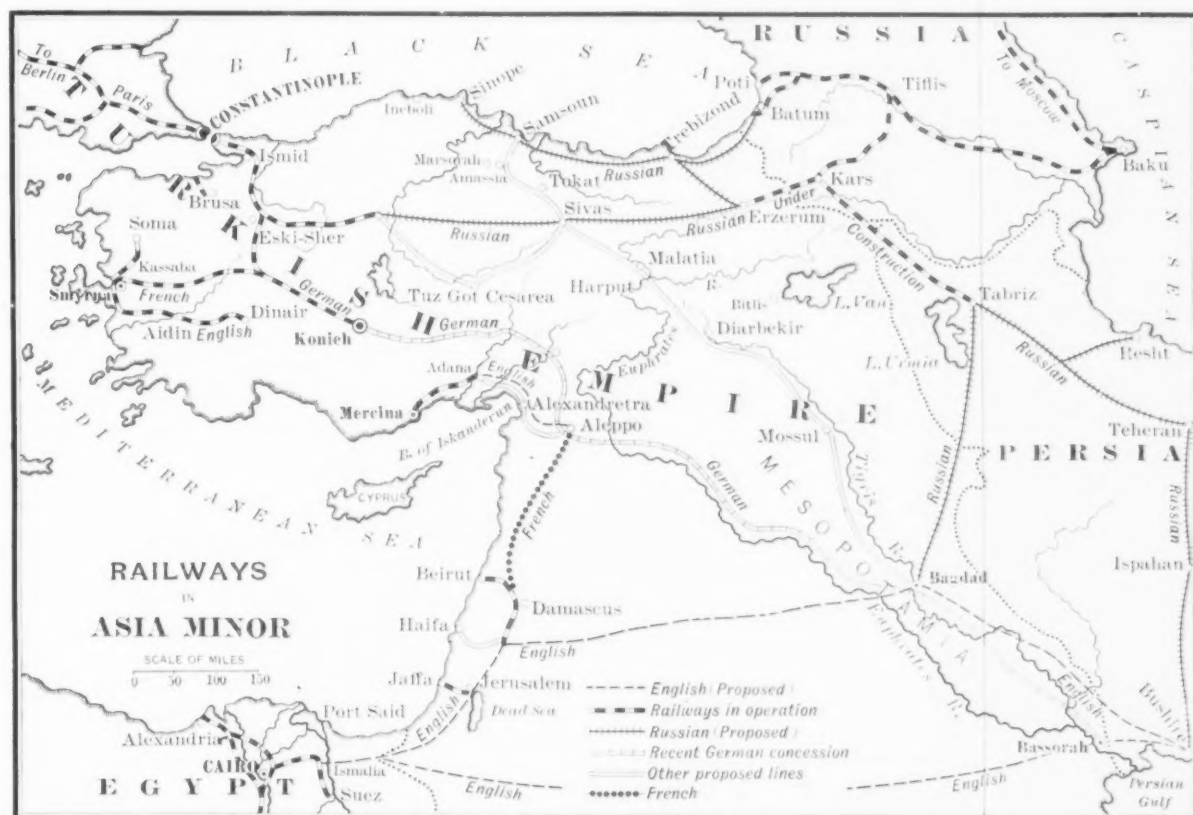
At the beginning of our life as a nation Turkey turned to us for an alliance against European aggression. It would seem strange if, after turning a deaf ear for more than a hundred years, we should at last be the means of restoring the Ottoman to commercial power. England from selfish motives would back our demands for an open door in the near East, and France, with her dwindling sphere in Syria, would gladly welcome such assurances, while Russia, to prevent the possibility of her way to the Persian Gulf and Palestine, where she is already establishing schools, being blocked by Germany, would doubtless assent, trusting that in the future, as her people emigrated by villages to the now waste provinces, making them inhabitable by extensive irrigation, Russian influence would become irresistible and sweep all before it.

England, awaking at last to the importance of not being crowded out, is preparing to protect the road to Egypt by building railroads across Arabia and Turkey to the Persian Gulf. Selecting a most fertile route, the Syria Otaman Railway Company, with a capital of £5,000,000, expect to build from Haifa to Damascus, and thence westward to Bagdad, and down the valley of the Tigris to Bushire, the center of English trade on the Persian Gulf. Germany, Russia and England are all heading their Oriental railroads for this point, England having in contemplation still another railroad from Suez across the Arabian desert to Bushire; and as a branch of this is to connect at Jerusalem or Damascus with the French line to Aleppo, which city the German railroads from Constantinople will soon connect with all Europe; when Rhodes' colossal scheme is carried to completion the Cape to Cairo road will more aptly be known as the Calais to Cape-town route. There is a bare possibility also of an all British railway route from Calcutta to the Cape. From Russorah to Kurachee, where the Indian railway touches Belluchistan, is but 1400 miles, but if the low coast line

is followed the railroad would pass through an irreclaimable desert for the entire distance. It would, however, connect the British, Asian and African railroads. Russia has far better routes than the above surveyed through the fertile regions of Persia, so that when Bombay is connected by rail with London it will probably be over Russian lines, unless Germany, for the glory of the nation, should determine to sink the \$100,000,000 necessary to bridge the 2500 miles of desert lying between Koneah and the borders of India.

Trebizond, on the Black Sea, will soon be made the commercial *entrepôt* of all Northern Turkey, Persia and Central Asia. From this Turkish port Russia's railways will radiate to all ports of Southern Asia. Here our ships, laden with railway construction material, will line the wharves, as they have done at Vladivostok and Port Arthur for the past few years. The great caravans to Kars and Tiflis will soon be abolished, and the civilizing steam engine and freight train will take their place. Tiflis, with its trans-Caucasian army of 270,000

to be gaining ground, and all the ready money of Russian territory was mortgaged to the trans-Siberian project. Muscovite diplomats in Teheran demanded of the willing Shah an agreement that he would permit no railways to be built in Persia for a period of ten years. The period covered by this strange contract expired in November, 1900, and has been followed by one far more advantageous to Russia, for the Czar's Government, by paying off Persia's debts to England, has taken the collection of Persian customs out of British hands, and by making a loan of several millions rubles to the late Shah induced him to give his royal word, secured by bond, not to permit any other power to build a railway in Persia without the consent of Russia. Belgian employees now collect Persian customs dues, and to those familiar with Russia's influence over the so-called Belgian syndicate, now building the Franco-Russian railway in China, it is needless to remark that nothing will be done by the Belgians contrary to the will of the Czar. Until Russia is quite ready to show her hand in



RAILWAYS IN ASIA MINOR.

Cossacks, is but a prophecy of the fate held in store for Trebizond.

Should Americans follow the example of the merchants of all other civilized nations and establish banks in Constantinople and other near and far Eastern centers of commerce, it would do more to give us the trade of Asia than any single effort we could possibly exert. Russia would encourage this, as it would not only bring our money markets nearer to her, but also simplify the methods of securing needed material from American manufacturers.

From Batum, on the Black Sea, trains run regularly to Baku, on the Caspian, and to the border of Turkey and Persia. Rails are being laid toward Constantinople and Teheran. In Persia, Tabriz will soon be reached; the construction of the projected road from this point to Bagdad, and the branch line to Resht, on the Caspian, will be pushed with vigor, thus throwing all of Northwestern Persia under Russian rule, for the Czar never allows one of his railways to proceed into territory not governed by himself. Persia has always been looked upon by Russia as her dependency, and several times during the present century slices have been officially annexed. Ten years ago, when British influence seemed

Persia it is possible that railway concessions will be given to Belgians; but at present, however, Russia is feeling her way to see how far she can go without receiving a remonstrance from Great Britain.

In Northern Persia Russia has for years been constructing a magnificent system of roadways through the mountains, in evident readiness for the laying of ties and rails. Following the trade routes from Trebizond to Teheran and on to Saracks, on the northern borders of Afghanistan, near Herat, Russia has pushed her trade and improvements, preparing a way for a railway which is to follow the old caravan trail. Never forgetful of the astute game she is playing, Russianized Armenians have been pushed forward as mercantile pioneers. They are loyal subjects of the Czar, and as they receive subsidies equal to the cost of transportation of their merchandise from the factories in Russia, it is needless to mention that British merchants have been driven out of North Persia. On every road in Persia built by Russia prohibitive rates are charged on freight coming from any foreign country; chiefly for this reason the British Persian Bank at Teheran fights the Russian concession for a railroad from that city to Bandar Abbas, on the Arabian Sea.

In Southern and Central Persia British interests are predominant. English capitalists have built excellent roads over which they send many millions of dollars' worth of their merchandise annually by caravans. Unlike Russia, however, they pay tribute to the fierce predatory tribes that exist by robbing caravans. The Czar solved the bandit problem in Northern Persia by stationing Cossacks along his roads, but in Southern Persia the heat is so fierce that no British soldier can live there, England having removed her troops from Bushire and Bandar Abbas many years ago. Feelings of mercy, however, do not actuate Russian generals, and preparations have been made to equip both these ports as Russian fortresses.

The Russian trans-Persian road from Kars to Bandar Abbas via Tabriz, Teheran, Hamadan and Ispahan, will be 1300 miles in length; the estimated cost of construction is \$75,000,000. From Ispahan a branch will project to Bushire, at the head of the Persian Gulf, where the German, English and Russian systems of railroads seemed destined to concentrate. Russian and English naval vessels now anxiously patrol the Persian Gulf, England insistent on retaining an open door, Russia growing defiant and but awaiting the completion of her iron railway from St. Petersburg to the two chief ports of the gulf before announcing her policy. That it will differ in any respect from the exclusive policy followed in Northern Persia no one doubts. These two railways, if they do not cause war, will give Russia strategic command of the Persian Gulf and an outlet to the Indian Ocean, and at last she can become a maritime power, and through the ports of Bushire and Bandar Abbas will pour a mighty stream of American commerce. Our ships from both the Atlantic and Pacific coasts will make them ports of call on their way to and from the Philippines; great freighters will carry thousands of tons of railway materials, from cross ties to locomotives, track laying tools to rails, to the new commercial Eldorado. Persia, five times as large as England, and under proper conditions more productive than California, will be at last opened up to civilization. Russia will give the Persians a far better government than they have ever known, taxes will be reduced, and travel made safe; under a system of irrigation the land will once more blossom like a rose, and Russia will be rich in a new possession. From Bandar Abbas the powerful steamers of the Volunteer fleet will carry the troops and immigrants to Russia in the Far East, now sent via the expensive trans-Siberian road or by way of the Atlantic and Mediterranean. A new rail and water route will be opened up and a naval base established which will cause Great Britain endless expense in keeping an increased fleet of ironclads in Indian waters.

For more than a century Russia has been reaching out for an outlet to the Indian Ocean, nor should we begrudge it to her, much as we may sympathize with England, for Great Britain can never develop and populate Persia, while Russia can and will. If only we aid England in maintaining the open door, Russia's absorption of Persia may be made to prove of vast advantage to American commerce.

Russia does well to build across Northern Persia to Herat, for she not only forms a new base in front of the trans-Caspian system, but opens up the richest part of all Iran as a granary for supplying an army for the invasion of India. This line is a strategic necessity, for in case of war hostile tribes could pour down from the mountains of Persia, swarm over the desert and wreck the trans-Caspian railroad. Russia saw the danger and prepared herself against it years ago by forcing Persia into a secret treaty granting the Czar permission to send his troops into Khorasan, the richest province of Persia, through which the new railroad will run for 300 miles. Russian agents already control and rule this section, while the Russian Imperial Telegraph lines reach all parts of Persia, being chiefly used to put down insurrections. More and more every year Persia comes under the domination of Russia, and the Shah must soon be his salaried vassal, much as is the Amur of Bokhara today.

It is not going too far to say that the Northern

Persians prefer the rule of the Czar to that of the Shah. Before the conquering Cossacks swept down over Central Asia the Northern Persians dared not plant their lands. Raids from the nomadic tribes of the desert were common. After the conquest of Sawark and Merve the Czar sent as a free gift to the Shah thousands of his subjects who had been made slaves by these raiders.

But for the unsurmountable chain of snow-clad peaks bordering the southern shores of the Caspian, Russia's Central Asia road would long since have been extended through Northern Persia to Baku, in Caucasian Russia. As it is, however, the nearest connection is still over the Caspian Sea, to Krasnovodsk, where the trans-Caspian railway begins its journey across the desert to the gateway of India. But from the north three lines of railway that connect with St. Petersburg are advancing southward; one, from Alexdof Gal, near the Volga, is being pushed with all speed to the Sea of Aral, thence it will follow the fertile valley of the Oxus, connecting with the trans-Caspian road at Charjui. From Orenburg, in the Urals, another railroad is to run southeasterly to Tashkent, following the valley of the Jaxartes, and at this ancient city a railway from Omsk on the trans-Siberian line will also end. Already the trains from the Caspian thunder into Tashkent, while the road has been pushed to Andijan, on the borders of Chinese Turkestan; soon the rails will cross the mountains and enter Kashgar. In fact, this city is even now considered but an outpost of Russia, surveys for a railroad across China from Kashgar to Peking having been in the course of active preparation for some years past. With only the trans-Caspian railway in operation Russia has civilized Central Asia and developed its resources to such an extent that the country has become not only self supporting, but besides exporting food stuffs to surrounding nations sends enough cotton to Russia to keep her mills going, making that country independent of Egypt and our Southern States. Millions of rubles are being spent on irrigation works, Russia's policy being to make two blades of grass grow where there has been one before. The tribes have been localized; and, exultant in their new prosperity, gladly pay the not overcrushing taxes demanded by the Government.

It is the building of the railroads down the valleys of the Oxus and the Jaxartes that promises to pour wealth into American pockets. Even now a party of Yankee investors are looking over the land at the invitation of the Czar, who, in exchange for some millions they contemplate spending in making a garden of Eden in this desert, will make extensive grants of territory. All that is needed for America to make a commercial conquest of this wonderful land, from whence the teeming hordes sprang to people and repeople India and Europe, is an entrance from the Arabian Sea. Russia would gladly connect her railroad system, now ending at Kushk, in Afghanistan, near Herat, with the Anglo-Indian roads terminating not 300 miles away, at Peshawar and Quetta, but British statesmen will not listen to such a proposition, fearing the powerful advantages it would give to Russia in case of war. Her merchants, too, oppose such a connection, for even now Russian goods sweep over the mountains by caravan and successfully compete with the British made articles. Still, however, England would certainly benefit by the completion of a railroad system which would place London within a week of Bombay and Calcutta. Her mails and merchants would no longer be compelled to take the tedious roundabout trip by water. With the rail connection made and Russian railway rates prevailing, the cost of a first-class ticket from England to India would be less than \$100, instead of fully three times that amount as at present. That Russia does not despair of eventually marching triumphantly into India by rail is evidenced by the fact that in addition to the lines she is now pushing through Persia to the Arabian Sea, secret preliminary surveys have been made by her engineers through Afghanistan and Beluchistan. One of these lines is projected from Herat to Kandahar and on through Kelat to Soumeani, on the very border of India, and almost touching Kurachi on the Arabian Sea, where the English trans-Indian railway system ends. The

building of this road would present no great engineering difficulties and would connect the western frontier of India for hundreds of miles by several routes with St. Petersburg.

From Samarcand a strategic Russian railway is also projected southward, passing through Kandahar. It would connect with the first mentioned route at Kandahar. Even in the Pamirs, the roof of the world, Russia is pushing her iron rails. In this region her borders touch those of India, causing the British Empire the expenditure of countless millions of treasure to adequately fortify her strategic position in Northern India.

In spite of every protest and even at the risk of war with England, Russia is determined to build at least one railway to the Persian Gulf, if not to Karachi, then Bandar Abbas or Bushire. She will never be content until the Dardanelles and the Persian Gulf are her strategic and commercial outposts, hence the reason for her activity in Turkey and Central Asia. No nation or combination of powers has ever yet succeeded in permanently thwarting any plan laid by Russian diplomats, therefore it would seem better for America to recognize the inexorable destiny of Asia as a field for Slavonic expansion, take time by the forelock and lead the powers in a demand for a permanently open door to all Asia. Such a compromise would prove a complete and satisfactory conquest for both American and Russian diplomacy, with the commercial advantages falling inevitably to Yankee traders, as the territorial acquisition would certainly become predominantly Russian.

The Production of Bessemer Steel and of Rails in 1901.

The American Iron and Steel Association has issued the statistics of the production of Bessemer steel ingots and castings in the United States in 1901; also of the production of Bessemer steel rails by the producers of Bessemer steel ingots. The ingot statistics include a few thousand tons of Bessemer steel castings.

Ingots.

The total production of Bessemer steel ingots in 1901 was 8,713,302 gross tons, against 6,684,770 tons in 1900, showing an increase in 1901 of 2,028,532 tons, over 30 per cent. The production of 1901 was by far the largest in our history. The following table gives our production of Bessemer steel ingots and steel castings in the last six years, including the production of the Robert-Bessemer and Tropenas works. Of the production last year 6764 tons were steel castings, against a similar production in 1900 of 6467 tons:

Years.	Bessemer Gross tons.	Years.	Bessemer Gross tons.
1896.....	3,919,906	1899.....	7,586,354
1897.....	5,475,315	1900.....	6,684,770
1898.....	6,609,017	1901.....	8,713,302

The production of Bessemer steel ingots in the last four years by States has been as follows:

	1898.	1899.	1900.	1901.
States.—Ingots.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pennsylvania	3,402,254	3,968,779	3,488,731	4,293,439
Ohio	1,489,115	1,679,237	1,388,124	2,154,846
Illinois	1,105,040	1,211,246	1,115,571	1,324,217
Other States.....	612,608	727,092	692,344	940,800
Totals.....	6,609,017	7,586,354	6,684,770	8,713,302

There were no Clapp-Griffiths works in operation in 1901, and only two Robert-Bessemer plants were active. Seven Tropenas plants were at work, the same number as in 1900. All the Robert-Bessemer and Tropenas plants were employed in the production of steel castings.

The Production of Steel Rails.

The production of all kinds of Bessemer steel rails by the producers of Bessemer steel ingots in 1901 was 2,836,273 gross tons, against a similar production in 1900 of 2,361,921 tons and of 2,240,767 tons in 1899. The maximum production of Bessemer steel rails by the producers of Bessemer steel ingots was reached in 1901. The year of next largest production was 1900, which was closely followed by its predecessor, 1899. In 1887, 14 years ago, 2,044,819 tons were made. This was the fourth year of largest production. The following table shows the production by States of Bessemer steel rails by the

producers of Bessemer steel ingots in the last four years. The figures given do not include a small quantity of rails made each year from purchased blooms or from rerolled steel rails, statistics for both of which products for 1901 are not yet available:

	1898.	1899.	1900.	1901.
States.—Rails.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pennsylvania	1,052,771	1,224,807	1,195,255	1,406,008
Other States.....	902,656	1,015,960	1,166,666	1,430,265
Totals.....	1,955,427	2,240,767	2,361,921	2,836,273

At the request of the manufacturers there was separated for 1897, for the first time, the production of Bessemer steel rails weighing 45 pounds and less than 85 pounds to the yard from those weighing less than 45 pounds and over 85 pounds. This separation, continued for 1901, shows as following:

	Under 45 pounds.	45 pounds and less than 85.	85 pounds and over.	Total.
States.—Rails.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pennsylvania	80,061	1,095,279	230,728	1,406,008
Other States.....	60,213	1,106,958	263,094	1,430,265
Totals for 1901..	140,274	2,202,237	493,822	2,836,273
Totals for 1900..	154,796	1,605,067	602,058	2,361,921

It will be noticed that there was a considerable decline in 1901 in the production of steel rails weighing 85 pounds and over as compared with 1900.

The total production of rails in 1901 will include rails made from open hearth steel and iron rails. When all the figures are collected it will probably be found that our total production of all kinds of rails in 1901 was about 2,875,000 tons.

Great Britain's largest annual production of Bessemer steel rails was in 1882, when she made 1,235,785 tons. In 1901 we more than doubled her best year's work.

The Norton Grinding Company.

The Norton Grinding Company of Worcester are to build a new machine shop at Barber's Crossing for the manufacture of heavy plain grinding machines, for which the company were organized. The business is now conducted in the machine shops of the Norton Emery Wheel Company, with whom the Norton Grinding Company are intimately associated. The new shop will be located near the plant of the Norton Emery Wheel Company, and will be 150 x 80 feet on the ground and two stories in height, although the main room of the shop will extend to the turret roof, which will provide ample light. Around this room at the second story will extend a gallery, in which the lighter tools will be located, although for the present the smaller parts of the grinder will be produced at the Norton Emery Wheel shops. The new shop will have every modern convenience, including an electric traveling crane capable of handling the heaviest work of the shop. All the heavy work of the grinders will be removed to the new plant as soon as it is completed. A considerable number of new tools have already been ordered, and more will be necessary as soon as the new quarters of the business are made ready to receive their equipment. A spur track will run into the shop from the Boston & Maine Railroad, which is close by the location. The demand for the Norton grinding machine has steadily increased since it was placed on the market comparatively few months ago, and it has already been established in many of the large machine shops of the country as well as abroad.

It has demonstrated its ability to do the accurate sizing of cylindrical work, in place of the "finishing" or "sizing" cut usually made with the lathe. It being of massive proportions enables it to remove enough stock to allow of very crude turning in the lathe. This fact very materially cheapens all lathe work, and gives round and smooth work at a cost much less than by the old lathe and file method. For example: A Rice & Sargeant engine exhaust valve 26½ inches long by 5½ inches in diameter is turned and ground complete to limit of 0.002 inch in 42 minutes. Another valve 12 inches in diameter by 60 inches long, weighing 827 pounds, was ground to a limit of 0.002 inch, removing 0.025 inch from the diameter, in 1 hour 15 minutes. Crucible steel lathe spindles 50 inches long with nine

diameters, the largest bearing being $5\frac{1}{2}$ inches, were rough turned from the forgings and ground to a 0.005 inch limit complete, ready to use, in five hours.

In many cases 12 to 30 hours of lathe work are saved with ten hours of work in the grinding machine. The company build two sizes of this machine, one weighing 11,000 pounds, the other 8000 pounds. They are provided with means for reducing the diameter of work as little as 0.00025 inch automatically.

Technical Education vs. Shop Education.

BY EGBERT P. WATSON.

A certain German philosopher, Jean Paul Richter, to wit, said: "Every man has two educations, that which is given to him, and the other that which he gives himself. Of the two kinds the latter is by far the most valuable. Indeed, all that is most worthy in a man he must work out and conquer for himself. It is that which constitutes his best nourishment. What we are merely taught seldom nourishes the mind like that which we teach ourselves."

Without endeavoring to force a parallel, it struck me when I read the above paragraph that it was apposite to the subject of technical education which is now occupying so much attention, and upon which such enormous sums have been and are still being expended in—to speak boldly—rethreshing old straw. In other words, the curriculum in all such institutions is to ground young men in the first principles of applied mechanics (kinetics), with occasional shop practice on all kinds of machine tools, and also in foundry, smithing, boiler work, &c. After a certain period spent in such pursuits, investigating all the phenomena likely and unlikely to occur in the management of them, coupled with an academic course, a young man graduates and receives a diploma as a bachelor of arts, or mechanical engineer, whichever he chooses. He is then ready to dispose of his services and talents to the highest bidder, for he naturally hopes that his profession will yield him, at the least, a living at once. In a majority of cases this does not occur, for with the vast number of technical institutes all over the country turning out mechanical engineers the supply is quite equal to the demand. On the other hand, the demand for workmen, pure and simple, who make no pretension to having technical educations, and have only what they may have obtained in the public schools, is far ahead of the supply, and will be for many years to come; it certainly will if the selfish policy of restricting the number of apprentices is universally adopted. A man in moderate circumstances has a son of 16 whom he wishes to see employed. This son rather inclines to mechanical subjects, and, having read of the careers of great engineers, is fired with an ambition to follow in their footsteps, and he so informs his father. If this parent is well read and wise in his generation he will say: "Son, look well before you leap; it is not given to all to become great in the occupations they embrace as a means of livelihood, and it by no means follows that because Ericsson was a great engineer you will be the same. The rank and file are a thousand to one compared to the generals, and, admitting that you gain their eminence in the course of long years, you reap very little in material wealth for all your labor. Engineers usually work upon salaries which are always inadequate, considering the time, labor and research they have spent upon their educations. They get no more than the average professional man, and although I have a wide acquaintance among them and have had for years, I do not know of any who have made more than an ordinary living—quite ordinary, too. Engineers have become rich, but not through their salaries unless the chances and possibilities were exceptional, not at all those that fall to their profession ordinarily. The number of these, too, is very small, and the sources of their wealth came in some cases from inheritance, in others from fortunate speculations to which they were prompted by financiering friends. Now if you feel that engineering is to be your life work, put your hand to the plow and look not back; I will do all that I can to help you."

This is excellent advice, and if the supposititious young man heeds it he will not repent it, for it is folly to choose a calling in life and then abandon it after the freshness of youth is gone. Suppose, however, the young man determines to become an engineer, and sends for circulars setting forth the advantages that certain institutions afford to those who wish to take a course of study, what does he learn from them? Nothing beyond the bare announcement of the branches pursued and the conditions to be observed; so far as any choice is concerned except that of locality he might as well enter one as the other. He does enter, and having obtained a diploma, goes forth to make a living. Not feeling competent to announce himself as a mechanical engineer in competition with others who have established businesses, he thinks it would be well to engage as a machinist in regular commercial work, where he must stand or fall by his ability. Acting upon his resolution he goes to a machine shop, and, presenting his diploma, asks for an engagement, for part of his course having been upon machine tools of all classes he feels quite familiar with shop work. He is disconcerted to be told by the foreman that his diploma has no value in his eyes, and that his experience has been too slight to enable him to be classed as a machinist. The only chance he can obtain is an opportunity to work for nothing until his value is shown, and not every shop is willing to do that.

What is actually needed to-day is men who can "come ready to go to work," as the phrase is, and they get but short shrift if their output is not up to the standard in quantity and quality. I know of one shop, where I had business lately, in which there were no less than six young men working on lathes and other machine tools who were paying 20 cents an hour for the privileges of the shop and instruction from time to time in commercial machine work. These men, so the proprietor assured me, were students who had taken courses in technical institutes, and were now taking supplementary courses in competitive work, so to call it, with men who had spent years in learning their trades for their bread and butter.

The assertions made are facts as I have found them, in no case fictitious "to point a moral or adorn a tale," and they set forth situations which will have to be met by those who rely upon the dicta of diplomas from whatever source as a means of instantaneous bread. These young men have had technical educations, as the phrase is commonly understood, but these are not available for returns without further outlays of time and money. Some, who may have honored me with their attention thus far, may feel that I have misapprehended the objects of technical institutes, and misstated them, in that they do not undertake to turn out finished workmen, and nowhere hold out such inducements to young men. The industrial, or workshop, part of the course is only to fit them to oversee and direct the exertions of mechanics in their employ, and to enable them to approximate the cost of contracts that may be offered them. This seems to me quite fallacious. How is a young man who has had but a few months', not years', experience with machine tool work in a dilettante sort of way, without the penalties of discharge in case of failure, no sort of responsibility to himself or any one else, to oversee the labors of others who have grown gray in the business? How can he arrive at anything like the cost when he does not know a tithe of the possibilities of hindrances and delays and how to circumvent them, and when he is a total stranger to the numberless tricks of the trade that can be played on him? He cannot do it; competition is so strong among men of long experience and high reputations that newcomers who are unknown to the trade cannot expect to get even a living, a very modest one, indeed, from mechanical engineering based wholly upon their technical school experiences for many years, and it is a mistake to hold out any other aspect of the matter to students. Of course, there are isolated instances where young men have, or can make, interest which will give them a living at least until they get a working experience, but the exception proves the rule; what are young graduates to do who are without influential connections?

It is not true that there are more posts of responsibility to be filled than there are men for them; in any case the ratio must be about 1000 to 1, for one capable supervisor can handle that number readily. The facts are quite in the opposite direction; there are more first-class workmen wanted than can be obtained, but technical schools disclaim any intention of furnishing workmen, and no employer who needs men would think of going to such an institution for them.

There is still another claim put forth for technical institutions which seems to be an unfortunate one in some respects, which is that through them a young man can obtain an education which will serve him in later years, even if he decides not to pursue it as a means of livelihood after graduation. This is a broken reed to lean upon. Art is said to be a jealous mistress, but a profession is still worse in this direction, for if a man would keep up in it he must travel with it, not behind it, for when, in case of disaster late in life, he attempts to resume it he will find that he is distanced. His knowledge of methods and processes is hopelessly out of date, and he will stand idle in the market place for a long time without demand for his services. Even if he has attempted to keep up in his profession his youth has passed, and he will find that his body will no longer obey his behests.

Now, on the other hand, if the youth mentioned in the first place had chosen to learn a trade and follow it as a business pursuit he would, in fewer years than is required in a profession, find himself in possession of something he could rely upon for a steady income even greater than his profession would have brought him in the same space of time. Moreover, there is nothing to prevent him from educating himself in the meantime to move up higher when the time comes, for, as Richter said, truly: "The education a man gives himself is far more valuable than that which is given him," and the shop knowledge which he has obtained by arduous toil therein is a negotiable qualification.

Nothing that has been said should be construed adversely as regards a technical education in itself; even superficial knowledge is better than none, but I have tried to show that the mere possession of a technical education is not to be relied upon as a means of income for some time after it has been gained, whereas the shop education is available within a reasonable period.

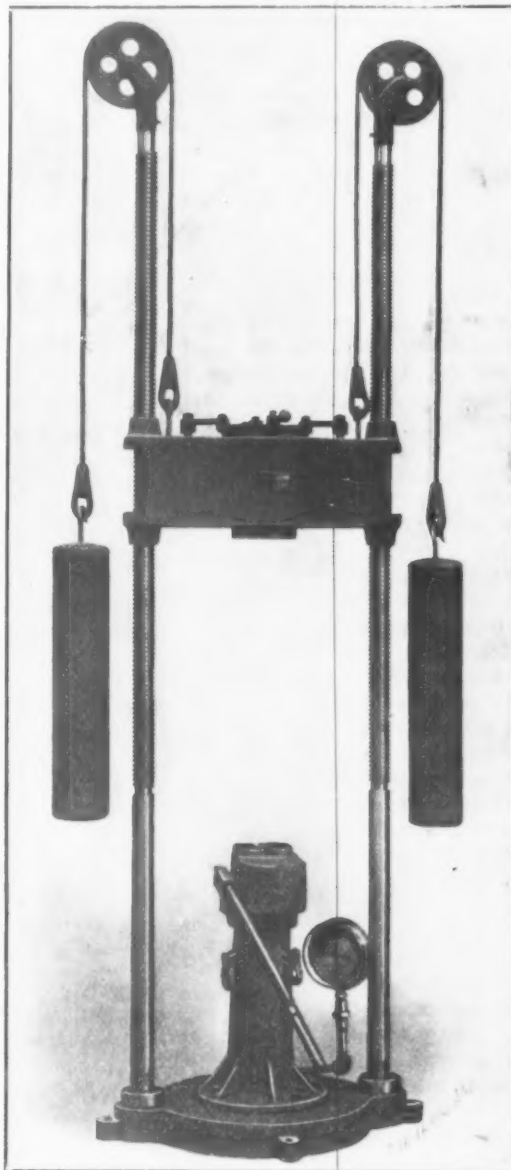
I hope I shall not do violence to any one's opinion when I say that in my view of this subject there is no connection whatever between skilled mechanics who offer manual dexterity only and universal technical education. They are both part of the machine business, it is true, but different branches of it. A capable workman knows that by following a certain course in handling his job he is sure of correct results, but he does this by training his hands wholly, for some of the best workmen I have ever known could neither read nor write; he has nothing to do with the mechanical principles or the proportions of it, and if the machine does not perform as it should it is not laid at the door of the workman. If he detected faults in design and pointed them out to his employer he would be considered as meddling with what did not concern him. If an experience of several years upon both designing and executing work has been of any value I must say that I do not think that mechanics, as a rule, need anything more than intelligent minds, aptness with tools, and ambition to excel, to place them in the front rank of their callings. This is the light in which employers look at it. Men who offer their services are not put through examinations as to their educations. The sole inquiries made of them are as to their qualifications as shop hands, and the kinds of work they have had the most experience upon. If the replies are satisfactory in the directions named they are taken on, and their tenure of place depends wholly upon their output. In no instance are they catechised as to their theoretical knowledge, and payment is made to them solely upon the basis of manual dexterity.

The United States Geological Survey has issued a splendidly illustrated and elaborate special report by George H. Eldridge on the asphalt and bituminous rock

deposits of the United States. It includes those of West Virginia, Kentucky, Indian Territory, Texas, Utah and California.

The Le Blond Arbor Press.

In their own works the R. K. Le Blond Machine Tool Company of Cincinnati have found the press here illustrated extremely convenient for pressing in large arbors, making press fits and for all work of similar character. It has a capacity of 40 tons, and the movement without resetting is 12 inches. It will take a piece 36



THE LE BLOND ARBOR PRESS.

inches in diameter. The head is plain, and can be quickly placed in any position and locked with half nuts in the screw.

Contracts for the building of the safe deposit vaults for the new trust company to be located in the Frick Building, Pittsburgh, are being executed at the present time. The vaults will be the largest in that city, being entirely constructed of armor plate. The plates are made by the Bethlehem Steel Company under the Harveyized process. It is said that the safe deposit vaults, exclusive of the banking department, are to contain 10,000 boxes. The name of the new trust company is still a matter of conjecture among financial men, and nothing is known of the plans of the new corporation. H. C. Frick is to be one of the principal factors of the company, however.

The National Industrial Association of England.

A new society has been formed in England with the avowed object of trying to bring capital and labor together in harmony with one another by common interest. This society is called The National Industrial Association, and its objects and aims are very broad indeed, much too long for us to quote, but Article IV, comprising the gist of the society's views, is given in full.

"To create and cement between employers and employed a feeling of common interest. To provide an association where employers and employed can meet upon the same plane and to create permanent machinery for conciliation which will be available in case of any threatened dispute between employers and their men."

These are unquestionably most praiseworthy objects, and, if they can be carried out practically, would at once usher in a trade millennium, but we are not sanguine that they will be attained, now or in the near future; they strive for too much. Our reasons for the faith that is in us have been given so often in *The Iron Age* that we should be merely repeating ourselves to assert them again, but we may venture to say that the clause which provides facilities for employers meeting their men upon the same plane is rather superfluous; they have such facilities now if they wish to avail themselves of them without the aid of an association, but the fact that the parties are at variance shows that they do not wish to meet upon any plane except their own, otherwise there would be no issues. Moreover, the custom of years and the ways of living in England are such as to create sliding social scales, wherein one man is not as good as another, and cannot be made so by act of Parliament or common consent. Nominally free and independent, they are actually subservient and confined to the narrow circle inscribed by whatever class they may happen to belong to, and they hang together in those classes with the full conviction that the other class has no opinions they are bound to respect. It must be evident to even a casual thinker that if there were any common plane where such different elements as those which comprise the various grades in England could meet and affiliate it would have been found long ago, and some sort of a treaty would have been contrived by which both parties could pursue the even tenor of their way peacefully, but the constant dissensions upon puerile grounds show that one class, at least, will not be bound by any sort of an agreement, but will break faith without notice as often as the whim seizes them.

The National Industrial Association is not a local organization formed by a few individuals to exploit themselves, but is well thought out, and embraces the principal employers of the Kingdom and large numbers of workmen. These last, curiously enough, eagerly take up any motion of this character and profess to give it their hearty countenance and support, but when it comes to the "harmonious action" clause it is found that their ideas of harmony are that all legislation shall be in favor of their side; when it is not they fall back upon their union tactics and make void and of no effect the propositions of the other class—the employers. Labor reforms, therefore, travel continually in a circle wherever unions exist in force.

The National Industrial Association has been at some pains to get the views of employers, and says, *inter alia*, "It has no intention of aggressively interfering with the internal organization of trades unions, but will devote its energies to the accomplishment of its thoroughly practical ideals by the diffusion of right knowledge and appeals to reason and common sense;" but it does not consider, apparently, that what is common sense to one party is construed as rank injustice by the other party, and provides no remedy for a condition of affairs in which neither reason nor common sense, as the words are usually construed, is present.

A letter of inquiry to Sir Hiram Maxim, an American mechanic who is now in business in England, brought the response from which we quote a portion condensed:

"I am certainly in favor of any movement which will produce a better feeling between employers and em-

ployed, but have you not undertaken rather a large contract? It appears to me very much like the digging of the Panama Canal: there are a lot of hard obstacles in the way which will require blowing up. When fresh from America it seemed to me to be a very simple matter to do away with the antagonism between master and men in England, so I sent to America and obtained a first-class mechanic, who I thought was just the man I required. This foreman after his arrival said that he knew just what the trouble was: the workmen hadn't been treated right, but he would soon cure that; he was going to treat every man in his employ as if he was an American; every man was to be put on his honor; he wouldn't watch them, but would be liberal with them. Englishmen looked all right and seemed fair minded when you talked to them, but the masters had not treated them properly. For one thing, he wouldn't have any piece-work system, but would offer premiums to the men who did the most work. As the first innovation this new American foreman fitted up a lavatory with hot and cold water, soap, towels and all necessaries, also lockers to hang their clothes in. To his surprise they used neither of these improvements; the lavatory seemed a funny proposition, for they didn't wish to wash, and that scheme fell to pieces. The next obstacle was that some of the men came late in the morning, and, the doors being shut upon the swing of the pendulum, the agile got through while the inevitable last man was docked 15 minutes. This caused immediate protest, and the late man said it wasn't fair. The foreman conceded that it wasn't, but said the door had to be shut at some time, and allowed one minute leeway. At once all the men took the leeway, until finally it got up to five minutes' loss of time, each man staying outside smoking until they began to commence coming in. The men continuing to ask further grace, the foreman returned to first principles and shut the door on the minute, after which there was no more trouble on that score."

Sir Hiram goes on to say that he tried to make himself popular with his men after the American custom, ran all the new tools, showed them how to use them to the best advantage, and actually dressed and tempered tools for them, so as to get them to do as much work as our men. He sent to this country and got a Fox lathe for brass working, which cost \$500 with all fittings, extra chucks, &c., to supplant an English hand lathe costing \$100, but the man who ran it did no more work on it than the hand lathe turned out, although he should have done ten times as much. After a great deal of talking to no purpose Sir Hiram ran the lathe himself, for the man had showed him what its capacity was; the workman thanked him, and said now that he saw the purpose of the tool he could run it as it should be, and he actually did for a few days, but in a few weeks he was using the Fox lathe as he did the old hand lathe; the trades union to which he belonged had interfered and forbid him from doing any more work than he did on the old tool.

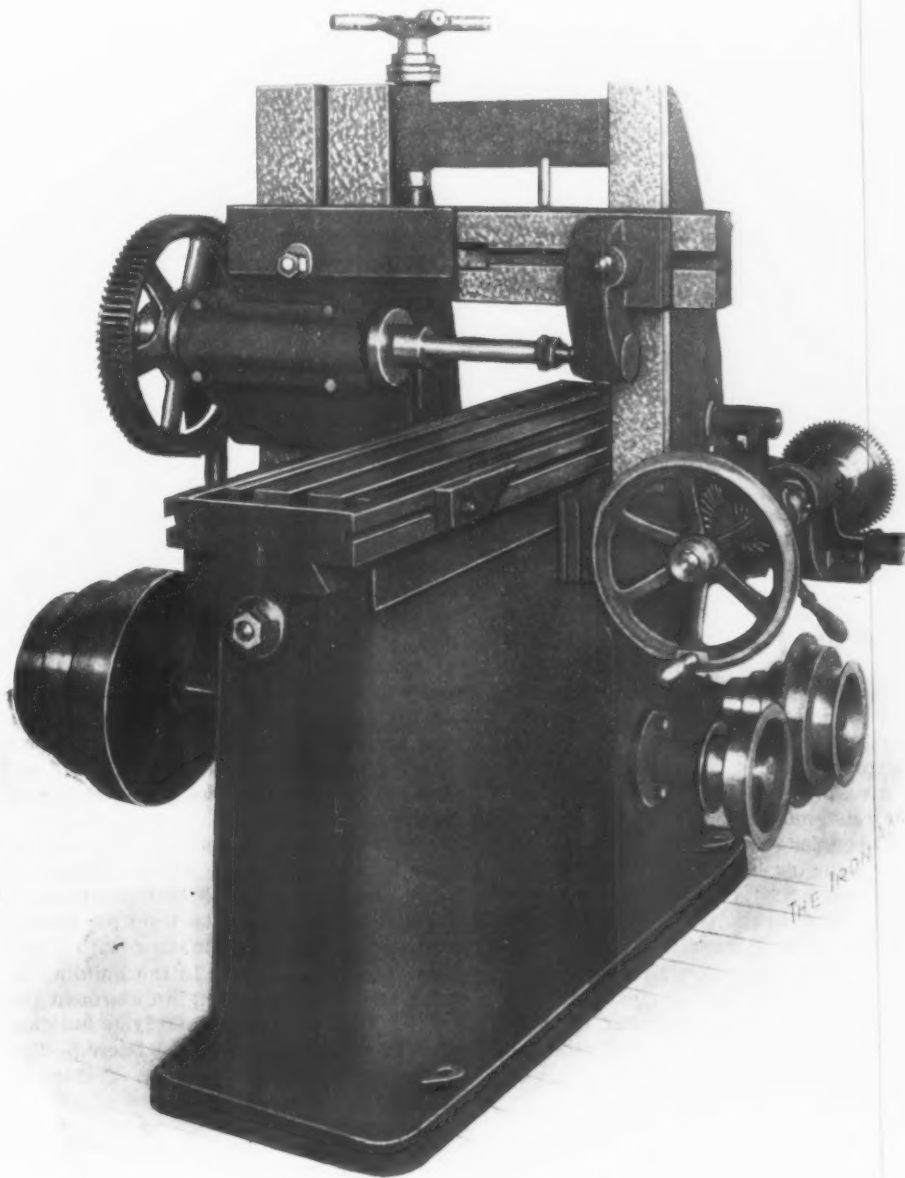
The men had social meetings occasionally at which Sir Hiram was invited to speak, and he tried to show them that it was England against the world now; the old times when they had had everything their own way were gone never to return, and it simply depended upon their English energy and pluck whether they would stay in the race for existence—not supremacy—or throw up their hands. Every man must do his utmost in order to keep work in England and prevent others from taking it away from them. The young men apparently understood and acceded by their applause, but, after he had departed, up would get the hide bound old English trade spouter and point out that what Sir Hiram had said was the greatest rot conceivable. These men said that it was as plain as the nose on one's face that the only way for workmen to get their fair share of the profits in any business was to get the biggest price for it that they could. Any one could see that if one man did the work of two he was taking the bread out of a comrade's mouth, and if Sir Hiram wanted more work done he should hire twice as many men; there were plenty outside of the gate now, waiting for jobs. The trades unions had the best of the argument, too, because plausible men are constantly filling their heads full of sophistries; for every

word we can say the labor agitator has ten. Sir Hiram's long letter concluded by saying that he would be glad to aid the National Industrial Association, but he very much feared that they had a hard row to hoe.

Mr. Plummer, manager of the United States Metallic Packing Company in Bradford, England, says, in response to a letter asking his co-operation, that he hopes for the success of the association, but has no use for it; he doesn't want better help than he has, and very much doubts the ability of any one man or set of men to accomplish any real good between master and man while politicians and wooden headed boards of this or that are

The Franklin Milling Machine.

William H. Lucas, superintendent of the Franklin Machine Works of Philadelphia, has recently designed a plain milling machine which is particularly adapted for milling small extra heavy work, such as high carbon special dies, which require a tool possessing extreme rigidity. The spindles are 3 inches in diameter, and are made of hammered high carbon crucible steel. The carriage feed is by screw, and is varied by means of feed cones from $\frac{1}{2}$ to 4 inches per minute. An automatic stop is provided. The screw for adjusting the



THE FRANKLIN MILLING MACHINE.

tampering and tinkering away at the laws all the while, and other employers utter similar sentiments.

From these excerpts it is easy to see that there is "no new thing under the sun" as regards the labor problem, for the issues are just the same and the disease is being treated in the same way—by lotions and external applications—which do not at all abate its virulence and activity. Indeed, it might be said that the difficulty has become chronic in England by the prevalence of class distinctions, and as these cannot be abolished or even modified, it is rather hopeless to expect radical changes at any time. Employers look down upon workmen, and these do not care whether they are looked down upon or not, they expect nothing else, so that where the labor question is concerned the English escutcheon shows a shield with the employer and the workman, one on either side, rampant.

spindle head is fitted with micrometer adjustment, and the cutters are adjusted by means of two nuts, one on each end of the arbor, making the spindles very solid. The rigidity of the machine is also increased by holding the arbor in place by a bolt, which goes all the way through the spindle and by which the arbor is held perfectly true at all times. The width of the feed table is 10 inches and the length 36 inches; work upto 12 inches can be admitted between the housings. The weight of the tool is 4000 pounds in the rough.

The United States Steel Corporation, through one of their officials, states that owing to continued scarcity of cars and locomotives the output of steel rails is very much curtailed, as the mills can neither obtain supplies nor make shipments as fast as desired.

Pacific Coast News.

SAN FRANCISCO, CAL., March 10, 1902.—The long strike is at last over. It was declared off on the night of the 5th after a long debate on the part of the members of the Machinists' Union. On the previous evening the proposal to declare it at an end had been adopted by two of the affiliated unions. The machinists had adjourned the matter and it was at first reported that they would reject the proposals laid before them by Mr. Arthur, who brought them from the Civic Federation. They were to the effect that the men return to work on the old terms, which included the ten-hour day and the old wages—that is, as many of them as could find places, the Civic Federation guaranteeing that within six months a settlement of hours and wages would be submitted to arbitration. They promised also that if possible all the questions of the character that had arisen in the iron trade in the United States should by that time be settled in all the iron works and shipyards. It seemed as if the question of accepting these terms would at first be decided in the negative, but prudence at length prevailed and all organizations affiliated with the Iron Trades Council, except two, accepted the offer. Next morning all the strikers that had remained in the city or were unemployed outside these two organizations presented themselves at their respective places of employment, and all for whom work could be found were again employed. About 100 were taken on the first day and the rest are slowly drifting back till before long all will have found places. It is extremely difficult to get at any exact estimate of the numbers of those who have returned to work and the papers publish what appear to be greatly exaggerated estimates. It had been given out that there were 1500 remaining out of those who at first went on strike, and if this were so, very few would have as yet returned to labor. I made special inquiries with the view of getting somewhere near the truth on this matter and was informed by a gentleman prominently connected with the iron trade that the whole number of strikers out of work did not exceed 500 men. These will soon be absorbed and the great strike will at last have passed into history. It has been a lesson to all concerned and the general sentiment now is that such a struggle should be rendered impossible in the future.

A gentleman who occupies a very prominent position in the manufacturing industry in this city said to your representative this afternoon: "I have worked as a machinist myself and nine hours is quite enough to labor in the iron trade. But it must be general; you cannot have nine hours in San Francisco with ten hours in Oakland, or *vice versa*, and you cannot have nine hours in San Francisco with ten hours even in Salt Lake City. The matter will be brought before the Civic Federation with the object of securing a nine-hour day by legislation. Congress has adopted an eight-hour day for Government work, and a law should be passed making nine hours a legal day's work—anything over or above that being reckoned as overtime. The majority rule and some such law should be made general. But I do not think that two hours can ever be knocked off the work day. Now that it is all over the strike has been notable for its freedom from violence. The boys stood out well." On asking him how many of them managed to do it, he answered that, outside the strike, the city was on the whole prosperous and that, though they had a rough time of it, most of them found something or other to do in town or country. Of course, a great many workers had been brought into the city from the outside. The Union Iron Works, for instance, had brought 1000 men from the East. The explanation of the fact that so few men comparatively remained to go to work is explained in this way: During the strike many returned to work and during the closing months labor was resumed in many establishments where a compromise had been arrived at. Then some had found other employments. There are now 3200 men at work at the Union Iron Works and a corresponding number at the other establishments. These will be added to day by day till every shop and yard has its full complement.

The Boiler Makers and the Iron Shipbuilders' Union have refused to declare the strike off, but I am credibly informed that most, if not all, their men are at work notwithstanding.

J. O. L.

The Waggoner Watchman Clock.

An improved electric clock for the purpose of recording the visit of a watchman to the different parts of the premises is manufactured by the Waggoner Watchman Clock Company, Grand Rapids, Mich. This clock has been on the market for a comparatively short time, but a large number are now in use. It has a unique method of registration. It prints the record on the back of the dial by means of a vibrator actuated by an electric current. Ordinary push buttons are used to make the contact, thus avoiding the use of keys, which may be lost or tampered with. The registration is entirely secret, the vibrators printing on the back of the dial by means of a typewriter ribbon. The time of the registration can be clearly seen when the dial is held to the light. The dial cannot be stopped through any manipulation of the wires or push buttons, and if the clock is short circuited a black line is printed on the back of the dial, showing the time and at what station the wires were tampered with.

The secret registration on the back of the dial is claimed to be a positive protection against the manipulation of the clock, for the reason that the arrangement of the stations cannot be ascertained except by reading the dial after its removal. Further than this, the arrangement of the stations can be easily altered by shifting the connections of the various vibrators should such a change be desired for any reason. Should an attempt be made to open the door of the clock with a duplicate key, a knife arrangement in the top of the clock cuts the edge of the dial and shows that the clock has been opened by some unauthorized person. The clock door may even be left unlocked, as the fact of this being opened will be shown on the dial. While the dials used are special, as regards the quality of the paper, any dial of the proper size and quality may be used. They are simple in design, and one can be ruled up with a lead pencil, if necessary, or in case of the shortage of dials one could stay on the clock a week and the watchman not know it.

An addition to the service of a clock of this kind is in the alarm adjustment which is furnished only in the Waggoner clock. If the watchman does not register within ten minutes of the time for starting his rounds an auxiliary connection moving with the dial closes the circuit and rings a gong in the building to be watched, at the same time sounding an alarm in the house of an official residing near the factory or building. The alarm will ring until the clock is registered. This attachment is entirely automatic. Another feature which can be added to the protective service of the clock is a fire alarm to be operated by thermostats placed at any desired point about the buildings. The alarm being sounded gives the watchman prompt notice of a fire. These clocks are made in three regular sizes, No. 1 being intended for four stations or less, No. 2 up to ten stations and No. 3 up to 14 stations.

A Southern Supply and Machinery Dealers' Association.—A circular has been issued over the signature of Smith-Courtney & Co., Richmond, Va.; the Henry Walke Company, of Norfolk; J. C. Christopher, Jacksonville, Fla.; Georgia Supply Company, Savannah, Ga., and the Cameron & Barkley Company of Charleston, S. C. It deals with the formation of a Southern supply and machinery dealers' association. We quote from it the following: "The first and most important step in consummating the preliminary arrangements was to secure the services of some one to act as promoter or organizer. We are very much gratified to announce that we have been so fortunate as to secure the services of C. B. Carter of Knoxville, Tenn., now secretary-treasurer of the Southern Hardware Jobbers' Association. Mr. Carter has served the Southern Hardware Jobbers' Association for about six years, and he is therefore eminently qualified to organize and take charge of the proposed association,

it being desirable that the two associations, which are so closely allied, be handled by one and the same officer. It had been deemed advisable to call a meeting of the supply and machinery dealers in March or April in Charleston, the exact date to be decided upon a little later."

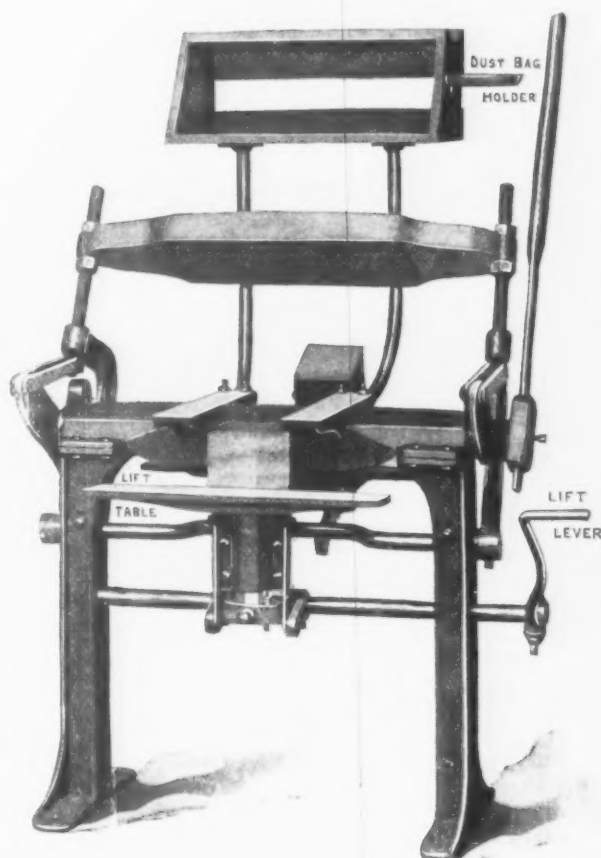
The Farwell Molding Machine.

The accompanying engravings illustrate two types of the Farwell universal molding machine, made by the Adams Company, Dubuque, Iowa. The machine combines the "squeezer" feature of the plain molding presses with the pattern drawing feature. They can be used either with or without stripping plates. When used with the stripping plate, the pattern, which is secured to a frame, rests firmly on the machine table, and the stripping plate rests on the pattern frame. It will be observed, therefore, that both pattern and stripping plate do not rest on the lift table, but are supported by the rigid machine table, where they can well withstand the ramming and pressing of the sand. The stripping plate is supplied with studs that extend down and rest on the lift table. When the lift lever is operated the lift tables are raised, thus raising the stripping plate and drawing the pattern.

When this feature is used without stripping plate it is called the "lift off" method. These patterns, like stripping plate patterns, are necessarily in two sets, one for copes and the other for drags, unless the work is of the symmetrical type and both copes and drags can be made from the same half pattern. The half patterns are secured to a plate. Studs resting on the lift tables extend up and pass loosely through the pattern plate and engage with the flask. When the lift lever is operated and the lift tables raised the flask is lifted off the pattern.

The stationary machine is 30 inches between the side rods, and the lever is adjustable from 20 to 40 inches. It will take in flasks up to 24 inches in length, 18 inches in width and 10 inches in depth. The portable

the week ended February 1 obtained from one of their steel furnaces at Cleveland Works the remarkable output of 563.45 tons of ingots, notwithstanding that the



Stationary Machine.



Portable Machine.

THE FARWELL MOLDING MACHINES.

machine is 38 inches between the side rods, and is adapted to flasks up to 32 inches in length, 18 inches in width and 10 inches in depth.

An English Steel Record.—The *London Iron and Coal Trades Review* says: "Bolkow, Vaughn & Co. during

furnace has been in continuous operation since June 21, and the coal consumed was only 0.31 ton per ton of steel produced. The material consisted of 50 per cent. pig iron and 50 per cent. scrap, and all of it was charged cold by hand. It is considered that this constitutes a European record for a basic lined furnace."

The Improvements of the Crucible Steel Company of America.

The Crucible Steel Company of America, who control 95 per cent. of the crucible steel manufactured in this country, occupy an almost unique position among the great manufacturing consolidations from the fact that it takes so many years to work up a demand for a new brand of crucible steel. In order to make the company absolutely independent in the matter of raw material, and since the company have also a large trade in open hearth plates and bars, the St. Clair Steel Company were organized about a year ago. The plant at present consists of 12 50-ton open hearth furnaces, but it is laid out with a view to later doubling this capacity should the demand warrant it. There were also organized the St. Clair Furnace Company, consisting of three 450-ton blast furnaces, which are also laid out with a view to future enlargements. The new works are located on 170 acres of bottom land at Clairton, in Allegheny County, Pa., on the line of the Pennsylvania Railroad, fronting almost a mile and a half on the Monongahela River on what is considered the finest manufacturing site either occupied or unoccupied in the vicinity of Pittsburgh. In order to afford every facility there has been organized a terminal railroad, and contracts have been let for the erection of a bridge across the Monongahela River which will connect with the Pittsburgh & Lake Erie Railroad on the north bank, and at the other end will be extended over to connect with the Baltimore & Ohio Railroad, and probably with the Wabash Railroad. With a view to future needs, the company have purchased 30 acres of river front on the Pittsburgh & Lake Erie side, and also have 63 acres of river front at West Elizabeth.

They are also building at Jersey City a very extensive cold rolling and drawing plant.

We present below a detailed description of these plants, beginning with the furnaces.

The St. Clair Furnace Company.

Before erecting the St. Clair furnaces the question of size was very carefully considered and thoroughly investigated, with the result that a capacity of 450 tons per furnace was decided upon instead of adopting stacks of larger capacity. The wisdom of adopting this size has been proven by the magnificent results that are being obtained from the use, in furnaces of this size, of practically all Mesaba ore. The mines in which the company are interested insure a supply of Mesaba ore, together with hard ores, for almost 20 years.

The blast furnace plant consists of three stacks 21 feet in diameter at the bosh by 85 feet in height, each stack being equipped with inclined skip hoists with electric hoisting engines. The stove equipment for each furnace consists of four three-pass Massick & Crooks' stoves, 21 feet in diameter by 95 feet in height. It will be noted that the stove capacity is large compared with the size of the furnaces. Blast is supplied to the furnaces by seven cross compound, condensing, steeple type blowing engines installed by the Southwark Foundry & Machine Company of Philadelphia, these providing an ample blowing capacity with one engine in reserve. Exhaust steam from the blowing engines is condensed by a 15,000 horse-power Weiss counter current condenser, also installed by the Southwark Foundry & Machine Company. This condenser also handles the exhaust steam from all of the auxiliary machinery, the pumping station and the electric power plant. Steam is supplied to the entire furnace plant by a battery of 12,000 horse-power Babcock & Wilcox water tube boilers, the fuel being the waste gas from the blast furnaces. These boilers also supply steam to the electric generating plant and the pumping station, both of which are located in close proximity.

The ore handling equipment is of the most modern type, being installed by the Brown Hoisting Machinery Company of Cleveland, Ohio. It consists of a car tippie with a capacity of turning over cars weighing with their contents 160,000 pounds, and of two traveling bridges having a length of 357 feet each, and fitted with

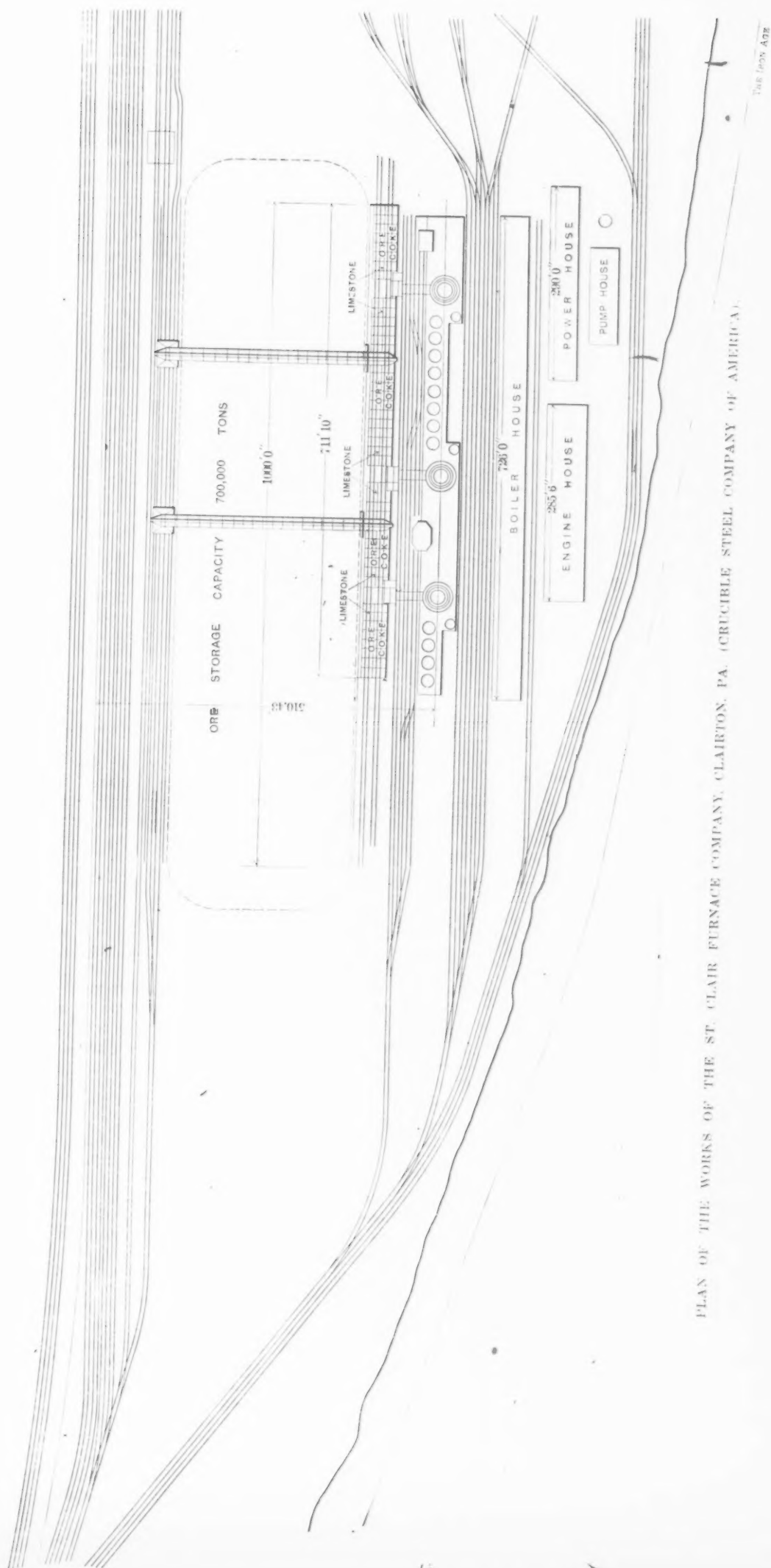
both shovel and grab buckets, so that either may be used, as the physical condition of the ore in the stock pile may require. The ore and coke bins are each continuous, and have a length of 711 feet. The ore is deposited in the bins by the traveling bridges, while the coke is unloaded directly from the cars, which are carried over the bins by an elevated track. Provision is made for handling the slag either by granulating it in pits and loading it in ordinary cars, or running it direct into cinder cars in the molten state. The iron is all to be handled in iron ladles, and run direct to the open hearth plant or to the casting machines as the occasion requires. The electric generating plant consists of three 550-kw. Westinghouse generators, each direct connected to a horizontal cross compound condensing Porter-Allen engine. Ample room is left for additional generators as may be required by the growth of the plant. The pumping station is equipped with three pumps, each of 10,000,000 gallons capacity, and driven by three vertical, cross compound, condensing engines, installed by Wilson-Snyder Mfg. Company. Ample room is also left here for additional pumps to meet future requirements.

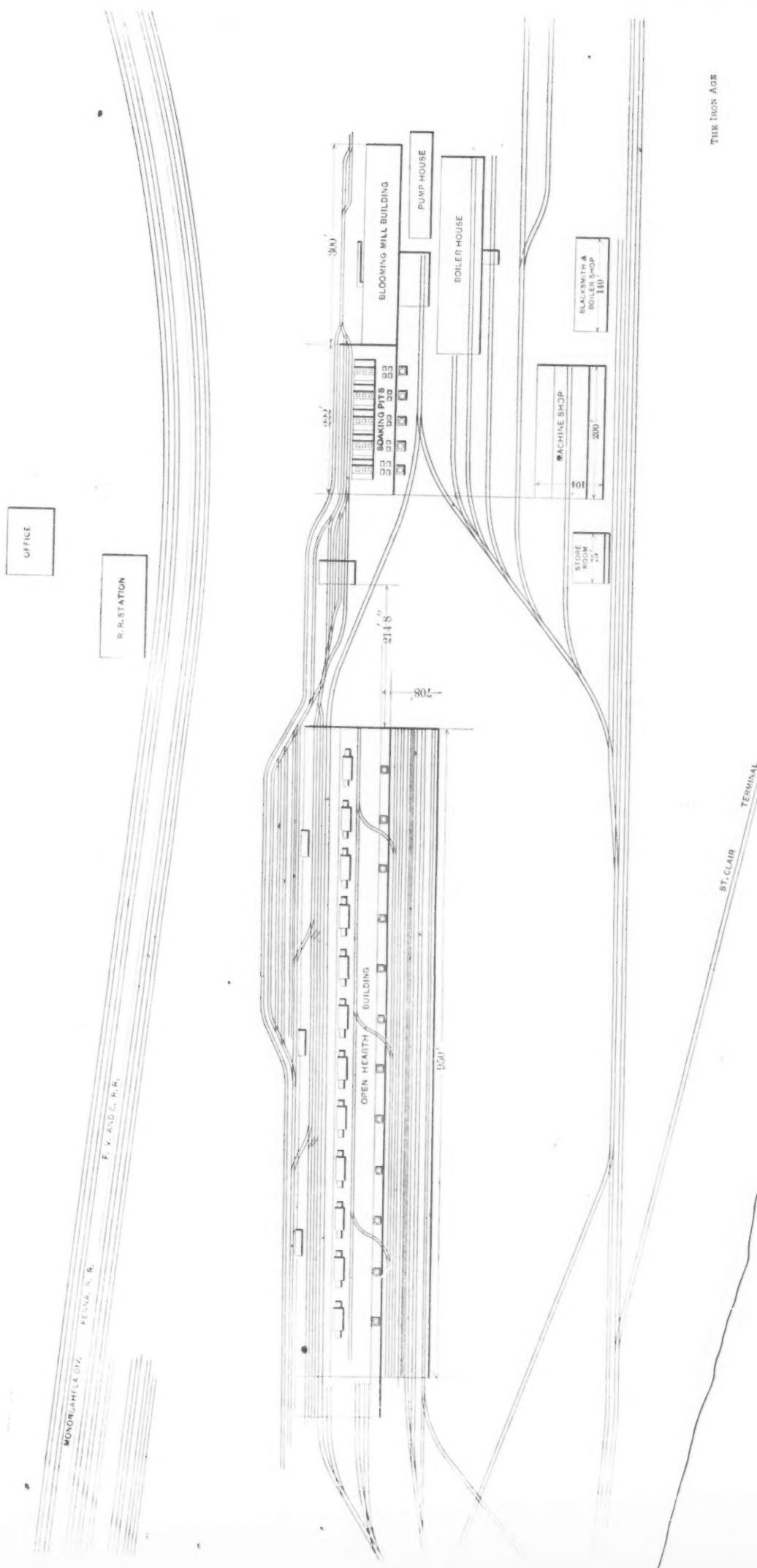
Our engravings show the plants of the St. Clair Furnace Company and of the St. Clair Steel Company. It will, of course, be understood that the latter is a continuation of the former, both overlapping somewhat in the drawings.

The St. Clair Steel Company.

With a view to getting maximum tonnage, as well as the finest open hearth product possible, the company sent the head of their open hearth department to Europe last year to investigate the Bertrand-Thiel process, with the result that they have acquired the exclusive use of same in this country. This process was fully described in *The Iron Age* about a year ago.

The open hearth building is 1010 feet long by 131 feet wide, and has a stock yard addition of 72 feet wide running the entire length of the building. The stock yard is on a level with the charging floor, permitting the stock to be taken into the side of the building. The open hearth building contains 12 50-ton stationary furnaces, which will be operated with natural gas, but which are built with ample regenerative chambers so that they can be put on producer gas at any time should the circumstances require it. This building also contains a 300-ton mixer. The furnaces are raised 10 feet, permitting the pouring floor to remain at the general yard level. They are charged by three low type Wellman-Seaver electric charging machines, and the crane equipment consists of three 75-ton ladle cranes, one 40-ton furnace crane and five 5-ton stock cranes, all built and installed by the Morgan Engineering Company. The steel is cast into 18 x 20 inch ingots on cars which are switched to the bloom mill, passing under a pair of Aiken vertical hydraulic ingot strippers, which lift off the mold. The ingot is passed on to the soaking pits, which are commanded by two vertical electric Morgan charging cranes. The soaking pits are five in number, each of four holes, with a capacity of four ingots each, making a total pit capacity of 80 ingots. The fuel to be used in these pits is natural gas. Here, also, provision is made for changing to producer gas if the occasion should demand. The blooming mill, installed by Mackintosh, Hemphill Company is 40 inches at the pinions, and is driven by a pair of reversing engines, 55 x 60 inches, direct connected without intermediate gears. This mill is provided with steam by 13 Stirling boilers of 500 horse-power each, equipped with Roney stokers and the most modern ash and coal handling machinery, installed by Heyl & Patterson of Pittsburgh. The output from the blooming mill will be loaded directly into cars by means of overhead traveling cranes commanding a large billet yard. In the immediate future, it is the intention of the company to add a roughing mill to make the smaller sizes of billets, slabs and blooms, thus taking a large amount of work from the blooming mill and thereby increasing its output. In addition to this, finishing mills are to be added from time to time as the occasion requires. The plant is also well equipped with mechanical shops, locomotive buildings, offices, laboratories, &c.





THE IRON AGE

PLAN OF THE WORKS OF THE ST. CLAIR STEEL COMPANY, CLAIRTON, PA. (CRUCIBLE STEEL COMPANY OF AMERICA).

The Cold Rolled Plant.

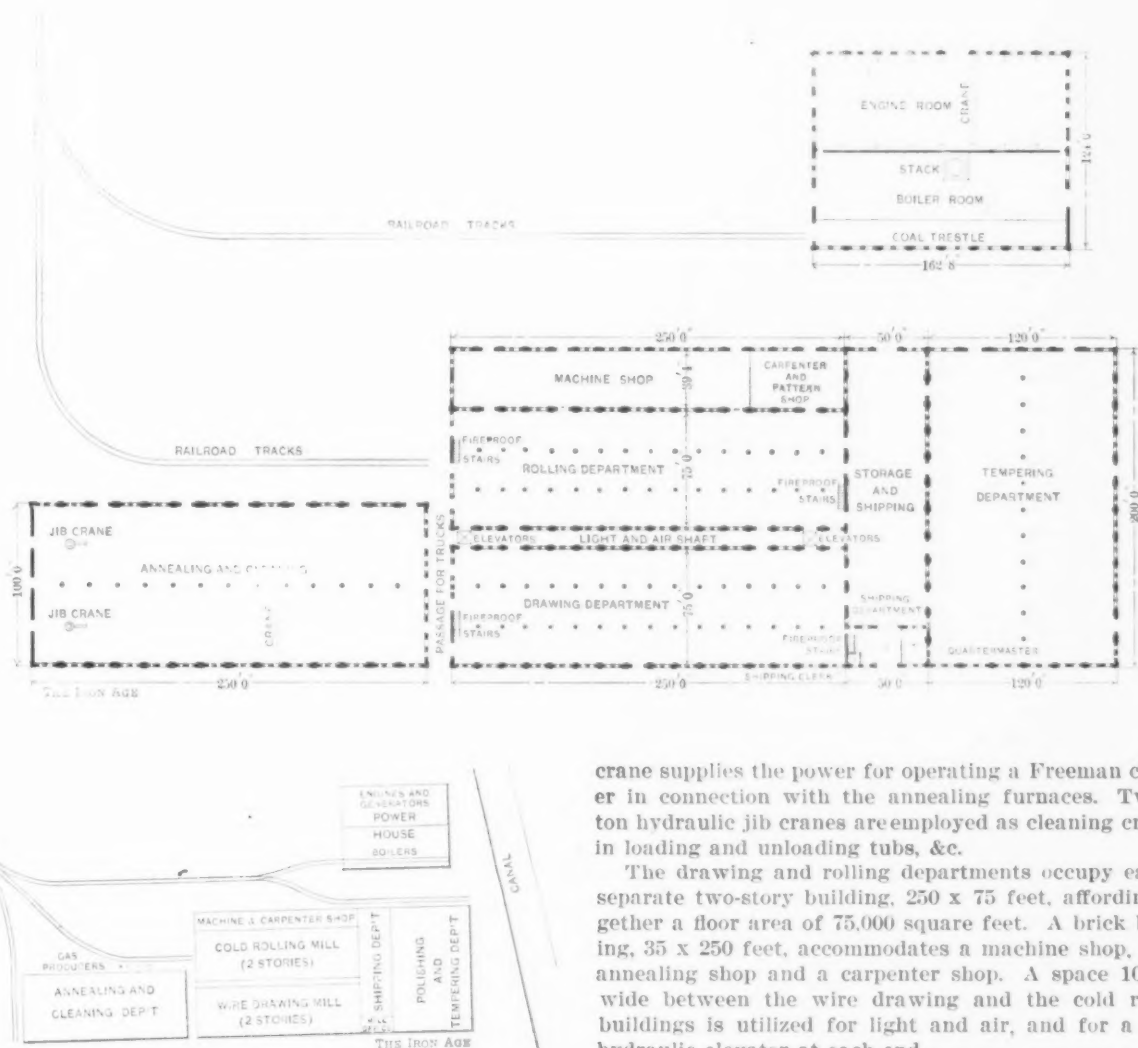
This works is built in connection with the Spaulding & Jennings plant in Jersey City, and consists of a new brick power house, 120 x 160 feet, with a division wall running longitudinally the entire length, providing two rooms, each 60 x 160, one for boilers and the other for engines and generators. A 10-ton overhead traveling crane runs the entire length of the engine room. Four 300 horse-power Babcock & Wilcox boilers have been put in, and four more will later be added, increasing the boiler capacity to 2400 horse-power.

Among the new engines are one Watts-Campbell high pressure Corliss noncondensing engine, 24 x 48, rated at 350 horse-power, which is geared down to a jack shaft that drives one of the mills; one Diehl 50-kw. direct current generator for lighting the old works; one

to Roney stokers, which carry it in a steady feed to the boilers. The same system conveys the ashes from the boilers to an elevated bin at the end of the power house, where the contents can be discharged through spouts to car or cart as may be desired.

The new wire drawing and cold rolling plant consists of an annealing and cleaning department, a wire drawing department, a cold rolling department and tempering and "patenting" department, the "patenting" being a system of tempering applied mainly to rope for wire cables. The plan shows the arrangement of the buildings.

The annealing and cleaning department is a one-story brick building, 250 x 100 feet, the equipment consisting of annealing furnaces, acid and lime baths, wire beaters, bakers and dry houses. A 15-ton electric traveling



THE SPAULDING & JENNINGS COLD ROLLING PLANT OF THE CRUCIBLE STEEL COMPANY OF AMERICA AT JERSEY CITY, N. J.

Westinghouse 375-kw. (nominally 600 horse-power) alternating current generator of the cross compound type for supplying power to the new works, and one Diehl 100-kw. direct current generator of the tandem compound type, to be used for crane service and to light the new plant. The generators are operated by Buckeye condensing engines, the exhaust steam being condensed by a Worthington elevated central condensing system, which includes a condenser, circulating pump and vacuum pump. Engines and generators are built on the direct connected unit system. Ample room is provided for installing double the power when required. The coal and ash system is operated by electric power. The coal is dumped from the car into a track hopper, passes through a coal crusher, and is carried by conveyors to overhead coal bunkers, having capacity for storing 350 to 400 tons, and then is fed automatically through spouts

crane supplies the power for operating a Freeman charger in connection with the annealing furnaces. Two 3-ton hydraulic jib cranes are employed as cleaning cranes, in loading and unloading tubs, &c.

The drawing and rolling departments occupy each a separate two-story building, 250 x 75 feet, affording together a floor area of 75,000 square feet. A brick building, 35 x 250 feet, accommodates a machine shop, a die annealing shop and a carpenter shop. A space 10 feet wide between the wire drawing and the cold rolling buildings is utilized for light and air, and for a 5-ton hydraulic elevator at each end.

The cold rolling department consists of electrically driven mills composed of hardened steel rolls, which are operated by motors singly and in groups of from six to ten pairs. The installation will eventually comprise about 200 complete mills. A notable feature in this department is an attachment applied to all of the mills, which brings the steel out perfectly smooth and straight. Thicknesses down to 0.0025 in extra wide sizes and widths as narrow as can be handled will be rolled. The accessory machinery in this department consists of slitting machines, filing machines, winding machines, straightening machines, scaling machines, &c. All are run by electric power, independent motors being employed wherever their use is found advantageous.

The wire drawing department will contain the latest type of machinery for drawing high carbon steel. These will consist of 250 wire drawing blocks, ranging in diameter from 12 to 24 inches. The pointing machines, power shearing machines and other accessories are run by electric power. In wire drawing, the material receives so much handling, owing to the necessity of frequent re-annealing, that a narrow gauge industrial railway, op-

erated electrically, is provided for expeditiously moving it. This railway also extends throughout the plant.

The tempering department is an important division, and is housed in a new brick building, 195 x 120 feet. The tempering is by the continuous process. The wire and ribbons are run off from swifts or reels through a system of open and closed retorts, baths, drawing furnaces, &c., in which the temperatures are automatically regulated, from which the material is finally run out on reeling frames, the reel, when full, being taken from the reeling frame and transferred to a striking frame and rewound on another reel in smaller coils.

The storage and shipping building is brick, 50 x 195 feet, and will be equipped with electric labor saving devices for handling the material expeditiously and economically.

The plant, as a whole, is designed for drawing and cold rolling all kinds of high carbon steel into wire, ribbons, special shapes, &c., and it is probably the most perfect of its kind in the world.

Lake Mining Matters.

DULUTH, MINN., March 17, 1902.—Efforts will be made by independent marine interests on the great lakes to delay the opening of navigation this year by withholding vessels from commission till May 1 at least. This is in order to bolster up the carrying rate. The ship owners are beginning to see that, as predicted in this correspondence for months, the rate of freight for the coming year will be lower than last season. They have been standing out against the 75-cent a ton offers of the United States Steel Corporation, demanding 80 cents a ton to Lake Erie ports, and have believed that they could hold that figure. This idea has now been abandoned, unless a concerted movement for a shorter season is inaugurated. In point of fact even this will be of no avail, and the wild rate for summer months will undoubtedly be lower than they have figured. The fact is that the lakes are practically open to-day, and a determined effort on the part of big ships would make a clear passage from Duluth to Lake Erie. By April 1 the ships of numerous carriers, such as the United States Steel Corporation, trunk line package freighters and mining concerns owning their own tonnage, will be in motion. The average date of opening of navigation on Lake Superior has been about April 20. Owing to a strike of lake engineers the commencement of business on a considerable scale last year was late in May. In other words, the opening this year will be 50 days earlier than in 1901. In that year 21,000,000 tons of ore were moved, in addition to the usual outside freight, including much corn. An added 60 days is an additional 25 per cent. capacity over last year for the ships then in motion. There is a largely increased tonnage in new bottoms, and while there is a probable big increase in ore, there will be little corn, and the increase of wheat off Lake Superior will be about 500,000 tons up to September 1. In the East the trunk lines from Buffalo seem to be laboring under a misconception of the situation. They are now holding at 5.4 cents as their share of the through lake and rail rate on grain from Duluth to Atlantic ports, their share being from afloat in Buffalo to aboard ship at ocean port. This is 0.9 cent above the rate for opening of navigation a year ago, and 1.15 cents above the rate by June 1 last year.

Upper lake railroads will begin shipping to dock soon, some of them within a week. There are said to be 1,500,000 tons of ore in stock at surface on the Gogebic range, which is an indication of what is expected there during the year. Stocks on the other old ranges are also very large. On the Gogebic several new mines will commence shipping, and increased outputs are expected at others as the result of new shafts and enlarged development. Never have so many men been employed on the range as now.

There is a scarcity of miners everywhere in the lake country, though not so great as to seriously impede operations. On the Menominee range this is especially noticeable, and at Crystal Falls mines there will be room for about 500 new men in the next few weeks, many of them at the Great Western. The Lamont, the

Bird, Hilltop and others will all need additional miners shortly. At the Iron River group of the Oliver Iron Mining Company 300 men are being taken on, and it is expected that more will be required there during the summer. At the Riverton and Dober, where the 300 are going in, a large amount of development has been done at the past few months, and both are in shape for extensive operations.

An option has been taken on what is known as the Arcturus property on the West Mesaba range for \$500,000 for the fee. This property was explored somewhat a number of years ago, and some 12,000,000 tons of ore were found therein. This ore is hard and of good character, but lies in thin seams intermingled with silica so closely that it has been economically impossible to separate it for smelting. Experiments have recently been made in Kentucky in washing this ore, and are said to have resulted successfully. The property is now under option at an advanced price to Eastern interests, and will probably some time be valuable. Few sales of Mesaba properties are being made just now, on account of the fact that little ore developed sufficiently to sell it on the market. Explorations are as lively as ever, perhaps more so, and some finds are looked for later. P. L. Kimberley and associates have formed the Elizabeth Iron Company, to operate or sell the State lease in section 12-57-21, recently under negotiation with Mr. Kimberley for \$225,000. There is a large ore body here of fairly good grade, though it is probable that some problems will be met with in mining. The United States Steel Corporation is understood to have taken an option on 80 acres of land adjoining the Lincoln Mine in section 4-58-17, and also on an 80 in section 12-58-18, which is already under exploration. Exploration is under way on a tract of land in section 22-58-19, which is 1 mile south of the formation according to the maps. Another exploration in section 34, same town, 2 miles south of the formation, which was reported to be of value, has been abandoned. Nobody conversant with the situation expected that ore would be found there. A wash of ore about 2 feet thick seduced the explorers into the expenditure of considerable money, but a hole more than 100 feet deep passed through nothing but Virginia slate. This is the history of a great many finds that are locally reported as promising great things.

Expectations for the Crystal Falls group of mines for the coming season are for an output of about 1,000,000 tons, which is more than they have ever produced. This includes about 500,000 tons from the Corrigan, McKinney & Co. mines; 275,000 tons from the Oliver mines; Hemlock, 130,000 tons; Bristol, 75,000 tons, and other interests smaller amounts. The Oliver Company's Mansfield mine will fall off, and the Corrigan Great Western will show a decrease. At this mine there is an immense amount of water, and it will be some time before it is ready for mining. The same is partially true of the Lamont, which will be unwatered at once. The Crystal Falls mine is making preparations for an output exceeding 260,000 tons. A number of explorations on the range are under way. In the North Hope explorations are showing ore running about 57.6 iron, 0.5 phosphorus and 9.25 silica, and there is apparently considerable of it.

At the Maas mine of the Cleveland Cliffs Company, at Negaunee, they are sinking with less difficulty than was expected from quicksand, and are approaching the ledge gradually. The shaft has been under way about four weeks. The expectations are that inside the coming year there will be 2000 additional miners at work in the city of Negaunee, including those at the Negaunee after it is reopened on the scale intended, those at the Maas and at the Hartford. There are other lands in Negaunee that will be explored and developed later, and the prospects of the town are very bright.

President L. W. Hill of the Eastern Railway of Minnesota states that his road will haul to Lake Superior this year about 4,000,000 tons of ore, an increase of 1,650,000 tons over last year. The road is working day and night to complete its new shipping dock in time for early use, and will begin hauling ore at once. The road is already fitting out its lake freighters for immediate service.

D. E. W.

Iron and Coal in Scotland.

GLASGOW, March 7, 1902.—There has been less animation in the warrant market this last week or so, but plenty of movement in iron all the same. Something like 10,000 tons Cleveland pig have been shipped at Middlesbro for Philadelphia, and it is rumored that orders for further 10,000 tons have been placed conditioned upon freight being obtainable, but this is unconfirmed. Several parcels both of Cleveland and Scotch iron have been sold to Canada for early shipment, while even now there is a cargo of 5000 tons on the way from Cape Breton to Glasgow. The Russian iron sold to come forward has not yet arrived here, but it is reported that a large shipment is being made from South Russia to the United States, surely a surprising thing, if true. No vessels have yet been chartered to convey from the Clyde any of the ordinary iron recently bought on American account, but a vessel has just loaded about 1500 tons mixed brands for San Francisco.

There are now 82 furnaces in blast in Scotland and 78 in Cleveland, with no immediate prospect of more being put into operation. Makers are well sold and are in no hurry to increase supplies, as they look for better prices later on. The drop in warrants this week is due to realizations by bulls and does not really represent the tone of the iron market. Hematite is in increasing demand. Middlesbro quality is now 56 shillings, which is more like its proper proportion to Cleveland ordinary; Cumberland is 59 shillings 6 pence, and Scotch hematite is 61 shillings 6 pence, delivered, steel works. The stocks of pig iron still tend to increase, and large quantities of Cleveland iron are coming week by week to Scotland, the difference in price being now 6 shillings per ton, which affords a margin for freight and charges. Steel ship plates have been advanced 2 shillings 6 pence per ton, not in consequence of renewed demand from shipbuilders, but of advance in material. There is a disposition to think that the tide is turning in America and that we shall soon feel some of the back sweep here.

While iron and steel manufacturers are moderately well employed, they complain that both pig iron and coal are too dear in relation to the prices obtainable for finished material. The continuation of the Coal Trade Conciliation Board until May 31 on the old basis practically means that there will be no change in miners' wages before then. The board have power to reduce then another 6 pence per day; as at the present rate of 6 shillings per day they are 6 pence above the minimum of the scale laid down in the constitution of the board. But it is unlikely that any change will be made until a new basis (which is being negotiated) is arranged for the reconstitution of the board. This is against any reduction in coal, the "dead season" for which will soon be over. The shipments keep fairly well up, but the output cannot be so much as is generally supposed or coal would be more plentiful. In 1901, however, the output of Scotland was 36,714,707 tons, as compared with 33,112,204 tons in 1900. This is an increase of 3,602,479 tons, following upon one of 1,969,492 tons in 1900 over 1899. A large proportion of the Scotch output, some estimate 40 per cent., is small stuff which has to be washed and screened, &c., before it is fit for market. Out of 100 tons dross as it comes out of the pit, it is usual by the treatment adopted to obtain 20 tons treble nuts, 20 tons double nuts and 30 tons single nuts, say 70 tons in all, salable at prices which are sometimes even proportionately higher than large coal. But the remaining 30 tons are merely dust and practically unsalable. It is therefore contended by the Scotch coal owners that all their small stuff, of which a large proportion is exported, should be exempt from the export duty, inasmuch as nuts are quite as much a manufactured article as the patent fuel of Wales, a composition of pitch and coal dust on which no export duty is charged, because the coal dust in it is valued at less than 6 shillings per ton. The Chancellor of the Exchequer has not yet taken the same view of the matter as the Scotch exporters, but they are tackling him again.

The advance statistics of the Home Office, just issued, show that the output of coal in the whole United

Kingdom last year was only 219,037,240 tons, as compared with 225,170,103 tons in 1900. This decrease is not due to any falling off in the producing capacity of the pits—Scotland, as was stated above, having made a large increase—but to the "stop-day" policy of the Welsh miners, and to the devices of the miners in other parts to check the decline in prices by restricting the supply. Of course they failed, because the decrease in demand was greater than the decrease in supply.

Of iron ore, the output last year was 6,849,926 tons, as compared with 7,667,528 tons in 1900. This is not a larger decrease than was expected considering the great falling off in the foreign demand for pig iron last year. The opening up of some new beds in Cumberland should help to build up a bigger total this year, but there is not much prospect of larger supplies from Spain.

An erroneous report has been circulated to the effect that the Cunard Company have ordered from a Clyde firm two new boats to beat everything afloat, 700 feet long, of 48,000 horse-power, and to steam 25 miles an hour at sea. No such orders have been placed here, and no order at all, I believe, has yet been placed by the Cunard Company. But the time is rapidly approaching when that company will have to make another move ahead, and the position, I understand, is this: They have asked two Clyde firms and one North of England firm to prepare designs and estimates for a 24 and a 23 knot boat. When these designs are submitted they will be collated and from them will be formed a definite design by the company's adoption of the best features of each. Then tenders will be invited. The project is thus some distance in the future. It is quite possible that the cost of obtaining the extra knot of speed may be out of all proportion to probable commercial results. That single knot may quite conceivably double or nearly double the engine power and coal consumption, while proportionately reducing the cargo and passenger space. It is much easier for the newspaper paragraphist than for the ship owner and shipbuilder to increase the speed of ocean greyhounds.

B. T.

In the United States Circuit Court at Pittsburgh last week the Pressed Steel Car Company secured an order restraining John M. Hansen from conveying or assigning certain letters patent or patents pending, and from interfering with the applications to secure patents. Hansen, who is now president of the recently organized Standard Steel Car Company, was formerly chief engineer of the Pressed Steel Car Company, and while acting in such capacity received a salary of \$10,000 per year. While in the employ of the company, it is alleged, he agreed to assign all patents and improvements he might make, but it is alleged that he has violated this clause of his contract.

The contract for the machinery of an aerial wire rope tramway connecting the Ferris-Haggerty group of mines with the Boston-Wyoming Smelter at Grand Encampment, Wyo., has been let to the A. Leschen & Sons Rope Company of St. Louis, Mo. The tramway is to be built according to the Leschen Company's patents and will operate automatically in receiving and discharging. It will be 16 miles long, the longest aerial tramway in the world. There are numerous tramways of the Leschen Company's patent automatic type now in successful operation throughout the mining regions.

The merger of the United Coal Company and the Ella Coal Company, both of Pittsburgh, into the United Coal & Coke Company of Pittsburgh was recorded last week in Harrisburg. The \$3,000,000 of stock is divided as follows: Common, \$2,000,000; first preferred, \$750,000; second preferred, \$250,000. The directors are: George A. Magoon, Pittsburgh, president; H. A. Kuhn, Edgewood Park, vice-president; J. B. Van Wagener, Pittsburgh, secretary, and V. S. Kuhn, Pittsburgh, general manager.

The Western Coal & Coke Company of Pittsburgh will receive a charter on April 1. The incorporators are P. Keil, J. T. Keil and Roy Wise.

A New Mill for Rerolling Rails.

From the *Railroad Gazette* we take the following description of a new mill for rerolling worn rails, which will be completed about May 1:

A new mill for rerolling worn rails is now building at Tremley Point, N. J., and will be completed about May 1. This makes the third mill owned by the American McKenna Process Company, the reorganized company working under the original patents granted to E. W. McKenna. Howard Morris, Milwaukee, Wis., is the president of this company; Julian L. Yale, Rookery Building, Chicago, is vice-president, and D. H. Lentz is general superintendent. A general plan of the new Tremley Point mill is shown in the accompanying engravings and also a plan of the mill layout.

Mr. McKenna, about 1891, while assistant general superintendent of the Chicago, Milwaukee & St. Paul, conceived the idea of rerolling worn rails, removing irregularities due to wear or other causes, and turning out a rail of the same height but otherwise of somewhat smaller cross section. The present system of rerolling was devised in 1892. Machinery was built and installed

customers. Outside of this the policy of the reorganized company will probably remain the same as in the past. Nothing has developed which seems to warrant any change in the mechanical or metallurgical processes, as the results given by the renewed rails in service have been satisfactory.

The Present Plant.

The Tremley Point plant is at Warner's Station on the Sound Shore branch of the Central Railroad of New Jersey. It is 4 miles southeast of Elizabethport, on the Arthur Kill, near the mouth of the Rahway River. This gives good facilities for transportation by water and eventually there is to be a big slip built, as outlined in the general layout, northeast of the mill. Railroad ferries will land loaded cars there and also receive shipments in cars. The company have 33 acres of land, and the buildings, of modern structural steel with galvanized steel roofs and sides, have about 77,000 square feet of floor surface.

The contract for dredging the waterway, filling the marshy site, putting in all foundations and putting up the buildings was given to Milliken Brothers of New

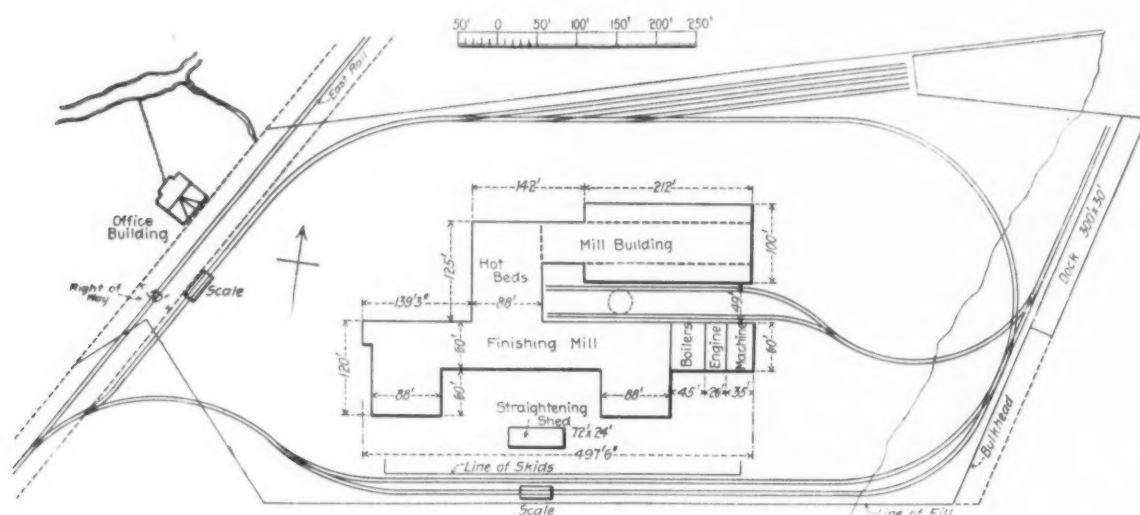


Fig. 1.—Plan.

NEW MILL FOR REROLLING RAILS.

in the North Chicago Rolling Mill, which was leased for a short time from the Illinois Steel Works, and about 3500 tons of rails were rerolled for experimental use.

A rerolling mill with two heating furnaces was started at Joliet, Ill., in 1897, and was built to have a capacity of 150 tons a day, but this capacity has since been increased by improvements up to about 220 tons a day single turn, or 410 tons double turn. The following year, 1898, a similar mill and of the same capacity was started in Kansas City, Kan., and up to the present time these two mills have turned out between 125,000 and 130,000 tons of rerolled rails. The Tremley Point plant will have three heating furnaces instead of two and will have a capacity of about 330 tons of rails, single turn of 12 hours, or 600 tons double turn. Naturally a number of improvements have been made in the new mill as the result of experience at Joliet and Kansas City, and the situation of the new plant in the East and on tidewater will extend the operations of the company to a new field.

Up to now the company have made a practice of receiving a particular lot of rails from a railroad, renewing them and then returning the same rails to the road which sent them. For this work a charge of from \$5 to \$6 a ton has been made. While this practice will doubtless be continued in the case of roads near the mills, yet it is the intention to proceed in the future on somewhat broader lines. Worn rails will be bought by the company, rerolled and sold to railroads the same as new rails are now sold. This will open up a larger market for rerolled rails and increase the number of possible

York, and work on the plant began last July. The contractors filled about 200,000 cubic yards, built about 700 feet of bulkheads and 300 feet of docks, and drove piles 40 feet to bed rock as a base for all foundations for buildings and machinery. The piles are driven as close together as possible, cut off below low water line and capped with concrete foundations, no grillage being used. The buildings are now complete, except putting on some of the sheet steel coverings. Milliken Brothers also built the runways for the main traveling crane, and have furnished the general layout of the plant, which is given herewith.

The relation of the several departments and the general dimensions of each are shown in the illustrations; also the apportionment of individual motors, and the arrangement of boilers, engines, generators, roll trains and rope drive. Two hot beds are shown, and there will be room for another train of rolls when needed. A new feature indicated near the hot beds is the cambering machine, three small rolls set vertically, between which the finished rail is properly cambered for cooling, on its way to the hot bed. This cambering was formerly done by hand, as in the older processes of rail making.

The outside dimensions of the furnaces are 36 feet 6 inches by 14 feet 3 inches, and inside they are 35 x 12 feet. There are two charging machines, in general like the one shown in the half-tone illustration, and each machine is driven by a 25 horse-power motor. One machine will charge two furnaces, and for the present the other machine will charge but one furnace. The waste heat will be used to generate steam in two ver-

tical Hyde tubular boilers at each furnace. Each of these boilers is of 200 horse-power, making 1200 horse-power to be generated from waste heat. This will be the main steam supply for all purposes. There is an auxilliary battery of two Heggie Brothers' horizontal

to three 150-kw. Milwaukee generators; each generator having a capacity of 250 amperes at 250 volts. The main rolling mill engine is a horizontal Corliss, 28 x 48 inches, made by the Frick Company, Waynesboro, Pa. It drives the roughing rolls by rope transmission and the

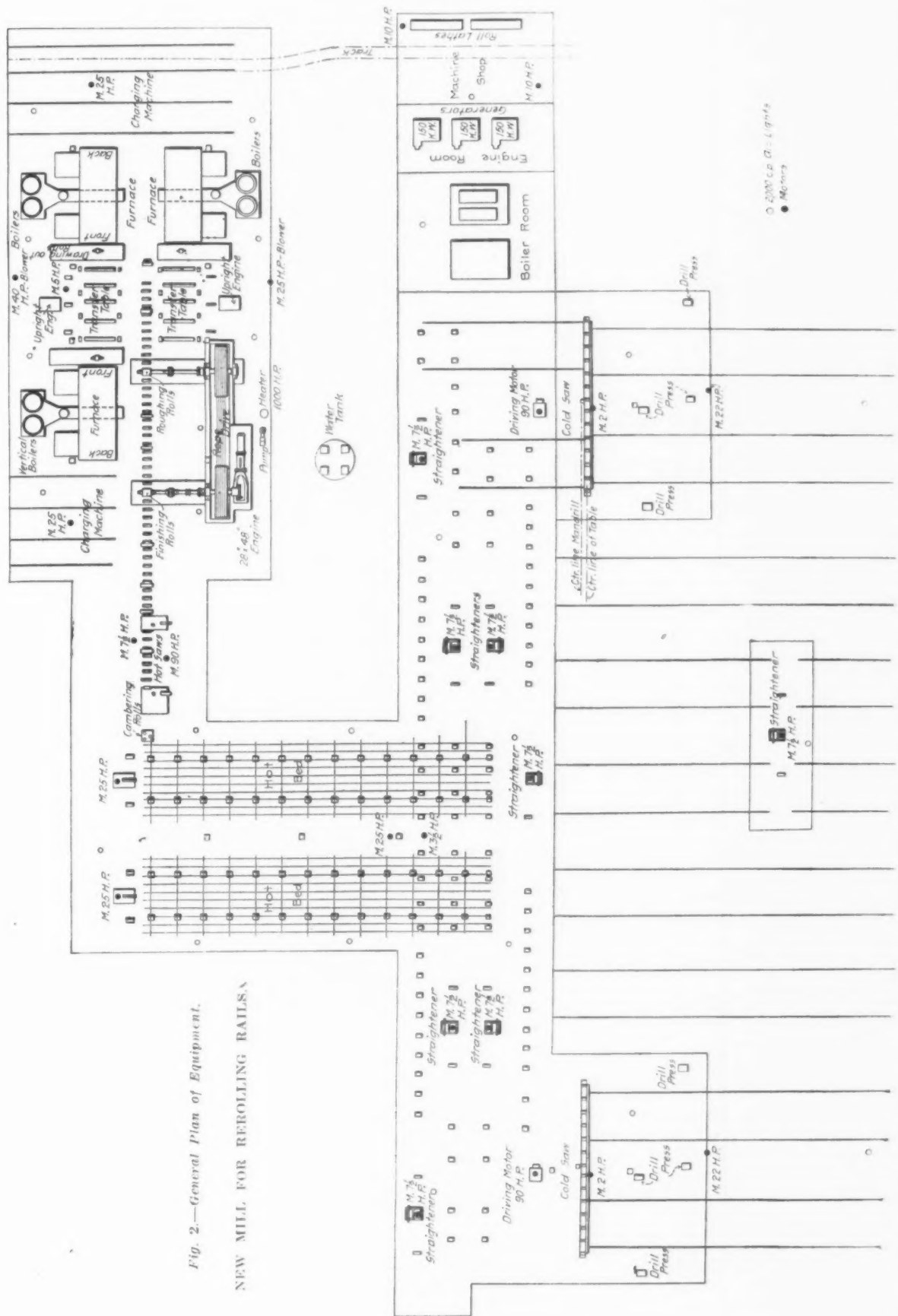


Fig. 2.—General Plan of Equipment.

NEW MILL FOR REROLLING RAILS.

flue boilers, 100 horse-power each, in the boiler room, and provision is made for another battery of the same capacity. These boilers are hand fired with soft coal.

There are three Harrisburg engines direct connected

finishing rolls by direct connection to the shaft. There are also two vertical engines of 150 horse-power each to operate the transfer tables and the drawing out rolls in front of the furnaces.

The Process.

Rails brought to the works are first unloaded and sorted as to height, curve wear and flowed heads, each kind being kept separate. Rails having flowed heads are taken to a specially designed grinding machine and the fins are ground off. In passing a rail through this machine the emery wheels are brought up against the rails and grind the head along one side. If there are fins on both sides of the head the rail is turned end for end and given another pass. The grinding machine at Tremley Point is driven by a 75 horse-power motor, and it takes about one and one-half minutes to grind a rail.

Each of the three furnaces at Tremley Point takes an average charge of 20 rails, the number depending upon the section. The charging machine will take a group of six or seven rails from the table alongside and run them into the rear of the furnace. The furnaces are of the reverberatory type, have two firing chambers, one at each end, and are fired with soft coal. Blast is furnished by two Buffalo forge fans, direct driven by one 25 horse-power motor and one of 40 horse-power.

Possibly it is not too much to say that the success of this process depends more upon this heating furnace than upon any other one thing. The difficulties in heating uniformly a 30-foot rail, owing to the unequal distribution of the metal, can readily be imagined, and the present furnace is the result of much study and experiment, and is fully protected by patents. The flanges of the rails rest on a brick floor, and the furnace is so formed that the heat impinges directly from the roof on the heads of the rails. This, and the effect of the floor in retarding the heating of the flanges, causes the heads to be heated at about the same rate as the webs and flanges. The heating is very uniform and under perfect control.

Robert W. Hunt & Co. about a year ago made temperature observations with a pyrometer at the Joliet Works with the following results: As drawn from the furnace, the rails average a little below 1800 degrees F. On the transfer table, just before passing to the leading rolls, the average temperature is about 1700 degrees F. When leaving the finishing rolls the average is about 1480 degrees, and on the hot bed, after being sawed and passed through the cambering rolls, the average temperature is about 1200 degrees. These observations show that in the McKenna process the temperatures are considerably lower than in usual rail mill practice.

After heating for about 30 minutes, the rails are taken from the furnace at the end opposite the charging machine. A hook is first inserted in one of the old bolt holes, and the rail is drawn out by a set of drawing out rolls mounted on a carriage that travels the width of the furnace front, and by a set of feed rolls, which, with the traversing arrangement, constitute the transfer table. The traversing arrangement consists of three small buggies operated by wire ropes and sheaves driven by a 5 horse-power motor. These buggies carry the rail across the transfer table and deliver it on the feed rollers of the roughing train. The rail passes through two sets of two-high rolls, roughing and finishing, respectively, receiving but two passes in total. It should be noted here that as the rail is drawn from the furnace the scale is removed from it by the pressure of the drawing out rolls and also by the use of some water spray.

Delivery to the hot saws from the finishing rolls is direct, and these saws and the cambering rolls are driven by a 90 horse-power motor. Beyond this, the process is like that of ordinary rail making. Eight straightening presses are driven by a 7½ horse-power motor each, and two sets of drills, four in each set, are driven from line shafting belted to a 22 horse-power motor. The cold saws are toothless, 52 inches in diameter, and are run at about 1700 r. p. m. by a 90 horse-power belted motor. Hydraulic power shifts the rail carriages at the hot and cold saws.

The machine and blacksmith shops are suitably equipped for roll turning and other repairs. The entire rolling mill department is served by a 10-ton electric travelling crane, built by the Case Mfg. Company, Co-

lumbus, Ohio, and a 5-ton crane serves the machine shops.

It will readily be seen that a special set of rolls is required for each different section of rails and much skill is shown in laying out these rolls. Some examples of the changes made in renewing old rails are shown by the accompanying engravings. Rails varying from 56 to 80 pounds per yard have so far been renewed, and on an average the furnace loss and loss by crop ends amounts to about 8 per cent., and from a 30-foot rail, if desired by the railroad, either a 31 or a 32-foot rail can be made.

Judging from the fractures and the known effects of working steel as in the McKenna process the opinion has been generally accepted that rerolling makes the rails tougher, more elastic and better able to resist wear. There is now available some information about rails in service which verifies this opinion.

Pittsburgh Manufacturers Moving Their Offices.

Prior to April 1 next many of the larger manufacturing concerns in Pittsburgh will remove from their present offices to other quarters, most of them going into the Frick Building, Fifth avenue and Grant street, which is almost completed, and into which some of the new tenants will move this week. In order to secure as tenants some of the large interests it is understood that Mr. Frick personally assumed unexpired leases of these concerns in other buildings. The Frick Building will probably contain the offices of more large manufacturing concerns than any other office building in the country, and it is said to be the finest office building in appointments in the world. It has been erected in a most remarkably short space of time, when the size of the structure is considered, work having started just about a year ago. The building is of granite, and rises 21 stories above the sidewalk.

After April 1 the Pittsburgh Plate Glass Company, now located in the Carnegie Building, will have its offices in the new Frick Building, occupying about an entire floor. A number of other concerns from the Carnegie Building will also move into the building, and the rooms vacated will be occupied by the Carnegie Steel Company, who require a great deal more office room since taking over the National Steel Company and the American Steel Hoop Company. The National Tube Company, who now occupy nearly three floors in the Conestoga Building, Wood and Water streets, and also have offices in the Empire Building, will take an entire floor. Among those who will occupy offices in the new building are the American Bridge Company and also the Crucible Steel Company of America, now in the Empire Building; the Standard Chain Company, now in the First National Bank Building, Fifth avenue and Wood street; the American Steel & Wire Company, now occupying nearly all of the eighth and ninth floors in the Tradesmen's Building; the Pressed Steel Car Company, also in the Tradesmen's Building; the Union Steel Company, now in the Empire Building; Goff, Horner & Co., Limited, selling agents for the output of black and galvanized sheets of the Muskingum Valley Steel Company, at Zanesville, Ohio, now located in the Lewis Block; the American Ingot Mold Company, now on the third floor of the Lewis Block, and the Duff Patents Company, builders of the Duff patent water seal gas producer, now in the Empire Building. The Cherry Valley Iron Company, now in the Murtland Building, and operating a blast furnace at Leetonia, Ohio, and another at Sharpsville, Pa., will remove to the People's Bank for Savings Building, another large office structure, on the corner of Fourth avenue and Wood street, in Pittsburgh, which is almost completed. Hubbard & Co., manufacturers of strap and T hinges and butts and also railroad tools, and who are building a two-mill sheet plant, whose offices are in the Hamilton Building, will remove on April 1 to the Murtland Building, Sixth avenue and Smithfield street. There will be many other changes in locations of manufacturing concerns of Pittsburgh after April 1, partly due to the prosperous condition of the iron trade and the large expansion in busi-

ness, which makes it necessary for many concerns to have more office room.

The fact that so many concerns are leaving the Carnegie Building will give the Carnegie Steel Company the opportunity of acquiring more office room, which that concern have been badly in need of for some time. The engineering department especially has been very much cramped in its present quarters, and will be given more room by taking some offices on the thirteenth floor of the Carnegie Building. It now occupies the whole of the fourteenth floor. The auditing department is also to be added to considerably, and the American Tin Plate Company will be brought into closer touch with the other constituent companies of the Carnegie Steel Company. The policy of the Frick Building owners has been to remain quiet regarding the prospective tenants who will occupy quarters there, as it is believed that by so doing the tenants will be benefited and less harassed until settled.

The Ship Subsidy Bill.

WASHINGTON, D. C., March 18, 1902.—The Senate passed the Frye Ship Subsidy bill at a late hour yesterday afternoon by a vote of 42 to 31.

Senator Frye closed the debate in a speech in which he declared that the pending bill would restore the American merchant marine and would enable the ship owners of the United States to secure a large part of the business which was now falling away from British steamship lines to the lines of other nations. Ten years ago, he said, England carried 63 per cent. of the ocean trade of the world, but to-day British vessels carried only 53 per cent. of that trade. Senator Hanna commented briefly on the bill before voting began, urging that the ocean carrying lines must be established where there was a fair prospect of adequate returns upon the investment. He insisted that it was a loss to the American people to pay \$150,000,000 or \$200,000,000 for the carrying of our foreign commerce, for under proper laws at least 50 per cent. of that amount would remain in the hands of Americans. No other country in the world, he said, except the United States could stand such a drain as that. The American merchant marine had gone down until it cut a sorry figure among the nations of the world, and strong measures were necessary to restore it.

When the voting began at least two score amendments were pending. The most important propositions for the amendment of the bill put forward by the opposition were the "Free Ship" substitute of Senator Vest, and his amendment providing against combinations of shipbuilders to increase the cost of construction of vessels or consolidations or agreements among vessel owners to maintain or increase freight rates. These provisions were originally drafted by Northwestern Republican members of the House, who have thus been forestalled by Senator Vest. Both the "Free Ship" substitute and the anti-trust amendments were rejected.

Senator Spooner then offered an amendment reserving to Congress the right to amend or repeal the law at any time, however it might impair any outstanding contract between the Government and a vessel owner, which was agreed to.

Senator Hanna presented three amendments. The first provided that no foreign built ship should receive any part of the subsidy granted under the bill; the second stipulated that nothing in the measure should prevent American citizens owning foreign vessels, and the third provided that no foreign built ship in any line acquired by American citizens should be admitted to American registry. All three amendments were agreed to.

Senator Allison offered an amendment providing that "no contract shall be made under the provisions of this title (General Subsidy) which shall extend beyond July 1, 1920," which was agreed to, as was also an amendment limiting contracts for mail subsidies to July 1, 1910. With a view to limiting payments to seaworthy vessels only, Senator Allison presented an amendment

providing that "all vessels receiving compensation under this section shall be at least of Class A 1 or its equivalent during the whole period for which payment is authorized under the provisions of this title." This was agreed to. For the purpose of limiting the total expenditure under the bill Senator Allison moved an amendment providing that not more than \$5,000,000 per annum should be expended up to July 1, 1907, and not more than \$8,000,000 per annum after that date. A final amendment offered by Senator Allison provided that vessels not making 8 knots speed with half loads on trial trips should be excluded from all compensation. Both these amendments were accepted by Senator Frye.

The final vote was then taken on the measure and, as above stated, it was passed by a majority of eleven. Senator Allison's vote against the bill after the Senate had adopted practically all of the important series of amendments offered by him occasioned a great deal of surprise, but the Senator from Iowa furnished no explanation of his course. Both Senators Spooner and Procter had given intimations that they would vote against the bill. Senators Dolliver, Quarles and Dillingham, it will be noted, followed the lead of the senior Senators from their respective States.

General Grosvenor, Chairman of the House Committee on Merchant Marine and Fisheries, has called a meeting of his committee for next week to consider the Subsidy bill in connection with the Douglas Shipping bill, now before that committee. General Grosvenor expresses the opinion that a bill will be reported to the House before April 15 and that a satisfactory measure will become a law during the present Congress.

W. L. C.

The Allis-Chalmers Company and Their Employees.

—The Allis-Chalmers Company have notified the employees of their various plants that a 5 per cent. increase will be made in their wages, beginning April 1. At the same time the working hours per week will be reduced to 55. The arrangement made is to run ten hours per day for five days in each week and five hours on Saturday, thus giving the men a weekly half holiday. The company have large works at Chicago, Milwaukee, Buffalo, Wilkes-Barre and Scranton. When the employees of the company struck last year it was just after an increase in pay and a shorter workday had been granted. The company refused the additional demand, but now take a step which will practically bring the wages of the workmen up to what was then asked. They have steadfastly maintained their ground against the efforts of the union and are to-day operating their works on a strictly nonunion basis. They state officially that they now have a full force of machinists at work, notwithstanding the claims made by their old workmen that the strike is still being carried on.

Opposition to the President of the Amalgamated Association in the West.

—The statement is made by workmen in Western rolling mills and steel works that if T. G. Shaffer is re-elected president of the Amalgamated Association of Iron, Steel and Tin Workers at the convention to be held at Wheeling, W. Va., next month a rival association will be organized. The proposed association will include the mills at South Chicago and Joliet, in Illinois; Milwaukee, Wis., and several others. The workmen in these mills are greatly dissatisfied at the course pursued by President Shaffer last summer in breaking the agreement made for the year, and they do not propose to belong to an organization controlled by him.

The *Railroad Gazette* prints revised figures relating to the amount of railroad building in 1901. Our contemporary now figures a total of 5368 miles, Texas leading with 537 miles, Oklahoma following with 428.7 miles, the other States and Territories with upward of 200 miles being Georgia, 212 miles; Iowa, 209 miles; Michigan, 205.5 miles; Minnesota, 200 miles; Missouri, 201.3 miles; New Mexico, 217.7 miles, and Wisconsin, 210.3 miles.

The Iron Age

New York, Thursday, March 20, 1902.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
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RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

The Department of Commerce.

With the creation of the ninth department of the executive branch of the Federal Government a new Cabinet officer, the Secretary of Commerce and Labor, will take his seat in the council of the President. His department promises before long to be the most important in the magnitude of its business and the popular interest of its work of any executive department, except the Treasury. It will start with 12 large and important bureaus, and how many will be added later on is a matter of conjecture. Its possibilities of expansion and differentiation are unlimited—we had almost said infinite. Although still in embryo, the question of its location has been discussed with as much interest as if it had a *de facto* existence. It is now probable that it will be housed in a suitable building erected for it at a cost of \$2,000,000, more or less, fronting on Pennsylvania avenue, near the Treasury. It may be considered significant by those with a taste for historic analogies that the plot of ground which it is proposed to use for this purpose, though now owned by the Government, once belonged to Henry Clay, and was traded by him for an Andalusian jackass, which was the putative progenitor of the modern race of Kentucky mules. Just what lesson may be drawn from this fact it is difficult to say. Probably it would depend upon how the person attempting it regards the proposed department. The jackass incident in the chain of title may seem more significant to some than to others.

What the new department will have to do is a question in which every one who gives any attention to the affairs of Government will doubtless be very much interested. The scope of its duties will be very large and their nature extremely varied. Primarily, it will be the only department of the Government which publishes a daily newspaper, a monthly magazine, a quarterly review and a variety of annual volumes. Its daily will be restricted wholly to foreign news, and its staff of reporters will be the consular agents of the Government all over the world. It will be edited on a somewhat unusual plan, in that its readers will be invited to suggest topics for reportorial inquiry. This is not a bad idea, by the way. We should not be surprised to see it adopted by proprietary newspapers of the "yellow" variety, though on a much less magnificent scale, as regards the salaries of reporters, than that adopted by the Government. Its line of publications will be generally that hitherto issued under the generic title of Commerce and Navigation, and the special reports which have emanated from the Treasury Department on all sorts of subjects other than financial. As it will circulate its publications gratuitously, it will have for them as large a circulation as it may desire.

It will have charge of the life saving service, which, under the fostering care of the Treasury Department, has grown from very crude and tentative beginnings to its present standard of magnitude and efficiency. Of this service the United States Government has every

reason to be proud. The dangerous parts of our coast are now thoroughly patrolled, and the frequent stations are equipped with the most perfect apparatus ever devised and manned by crews of brave and resolute men, whose record of life saving is better than that of any service of the kind in the world. It will also have the care and management of lighthouses, of which there are now 750 on the Atlantic, 130 on the Pacific, 280 on the lakes and 1600 in or along navigable rivers. Also it will have, as a subdivision or variant of its maritime responsibilities, charge of Government fish hatcheries. The business of maintaining and conserving the supplies of food fishes of the kinds which admit of artificial propagation is large and important.

In its responsibility for the commercial interests of the country it is difficult to see just where its work begins and that of necessity devolving upon the Treasury Department ends. No doubt this will determine itself satisfactorily in practice. The result is likely to be that its functions in the matter of our commercial relations with other countries will not be of great practical importance, but that makes no great difference. It will not appoint nor control consuls, but it will publish what they send in; and, in like manner, by celebrating the results of our foreign trade enterprise, it will attract a great deal of attention to itself and appear to be vastly busy and immensely useful. Captain Bragg—afterward General—won his brevet in the Mexican war by maintaining a vigorous bombardment, by which he made so much smoke that it was never known until he subsequently told it that there was nothing in front of him to be damaged by or respond to his fire. It accomplished its purpose, all the same.

Into the hands of the new department will pass the management and regulation of immigration. This, under the gradually narrowing legal restrictions imposed by acts of Congress passed in obedience to the mandates of organized labor, will be a difficult and at times anxious responsibility. It is proper that it should be so regarded. We have outlived the notion that it is our duty or our interest to make this country the dumping ground for the social and moral degenerates of countries anxious to diminish their burdens of pauper dependents. While it is true that in this country even the least desirable class of immigrants may become useful and tributary, at least through their descendants, to the national progress, it is by no means as true as it was 50 years ago, and it will be still less true from year to year as we develop and grow. One of the most important of the functions of the new department will be that which deals with the problems of quarantine. Since the observations in Cuba on the causation of yellow fever, and the conclusive demonstration that it is communicable not by contact with its fomites, but solely by inoculation effected by the sting of the *Culex fasciatus*, the fact has been slowly but surely gaining ground that much of the interruption of commerce, due to the detention and fumigation of ships from ports where yellow fever is reported, savors more of mediæval superstition than of modern scientific State medicine. Under a new administration it is to be hoped that all this will be changed. The new light which has dawned upon the medical staff of the army since the Cuban campaign, and the larger intelligence in such matters which has been gained by the Marine Hospital Corps, will probably co-operate to set the new department as nearly right as possible at the outset. If so, commerce will be immensely the gainer.

It will have charge of everything of concern to the Government relating to our merchant marine, the regis-

tration of vessels, tonnage taxes, port charges, the enlistment and treatment of sailors and the like, and will have an agent at each port who will arbitrate or otherwise control the settlement of disputes relative to sailors' wages, &c. Ship masters will be required to account for men sailing under their command, and charges of ill treatment will be promptly investigated by the agents of the department.

The Permanent Census Bureau will be under the management of the new Secretary, which will publish returns showing the facts of industrial development in the interval between the decennial enumerations. It will look after crop statistics and such matters, and will absorb the Bureau of Labor, to the work of which it is expected a little more practical direction will be given. Generally speaking, it will relieve the Treasury Department of the mass of duties and responsibilities which have gradually attached themselves to it for no better reason than that there seems to be no other department in a position to look after them, and because they seemed to be in some sense an outgrowth of the connection of that department with customs duties and the regulation of commerce. It can be very useful, and probably will be; and if it could absorb the Department of Agriculture and subordinate its picayune activities to those of a minor bureau much advantage would result.

Our Railroad Earnings.

The railroads of the country were affected adversely during the month of February by some of the same elements which caused suffering to the iron industry, but under the circumstances the gross earnings of the roads which have been heard from, while reflecting a restraining force, indicate the existence of the same virility which has marked the operations of the common carriers for many months.

According to the preliminary statement made by the *Commercial and Financial Chronicle*, 92 railroads, having a mileage of 94,914, earned \$50,301,694 gross during the second month of this year, against \$48,404,740 earned by the same companies, covering 93,269 miles, during February, 1901, a gain of \$1,896,954. But an analysis of the statement in detail is less favorable than might be inferred from the mere statement of gain. Out of the 92 roads reporting 32 show losses, and when only the larger changes are considered—these amounting to \$30,000 and over being taken by the *Chronicle*—almost as many roads are shown to have lost as have gained. Of the 16 roads showing important increases only seven have gained over \$100,000 each, and four-fifths of the gains by these roads were made by the North Pacific group—the Northern Pacific, Great Northern and Canadian Pacific—the Northern Pacific leading with an increase of \$607,027. The very favorable showing made by these three roads is attributed mainly to the heavy movement in spring wheat made possible by the large crop last season. The deliveries at Duluth were conspicuously large, being 2,113,645 bushels during February and 4,027,975 bushels since January 1.

Storms—snow, hail, wind and rain—and floods prevailed over the major portion of the country at various times during February, retarding the movement of much merchandise; but notwithstanding these drawbacks the decreased earnings, where suffered, were only slight. And here it is well to remember that the comparisons are made with a time when very large earnings were the rule.

Aside from the liberal marketing of spring wheat to the grain centers in the Northwest, the movement of

cereals, on the whole, during the month was light. As was to be expected, the falling off was most notable in corn and oats, resulting from the crop failures of last season, the deliveries of corn being, in round numbers, 7,300,000 bushels, against 21,700,000 bushels in February last year, while the receipts of oats were a little less than 7,000,000 bushels, against about 14,000,000 bushels a year ago; the decrease in the wheat deliveries was about 900,000 bushels. Taking the entire movement in wheat, corn, oats, rye and barley, there was a falling off of nearly 50 per cent.

But the same chief factor that caused a smaller movement of grain—short crops—caused an increased marketing of live stock, it being more profitable to dispose of hogs and cattle than to feed the stock on the grain at the relative prices prevailing in the markets.

These movements in grain, provisions and live stock have been prominently reflected in the returns of the Western roads centering at Chicago, that being the largest market.

The Southern railways, as a rule, have been benefited by a larger movement of cotton, there being a material increase in the receipts at the outports as well as in the overland movement during the month.

In classifying the various roads in the usual manner the *Chronicle* makes it readily apparent that only the Southwestern roads have sustained losses as a group, and even these are small.

The gross earnings of the same 92 roads referred to from January 1 to March 1 aggregate \$108,781,813, compared with \$102,230,497 during the corresponding period of 1901, a net increase of \$6,451,316.

Those who are looking forward to decreased earnings of the railroads as one of the first signs of a reaction in our business prosperity must therefore be content to wait.

The Labor Outlook.

The whole condition of trade is so satisfactory and the outlook for the future is so extremely encouraging that a long period of prosperity seems assured. But an effective way in which this prosperity can be checked is by a series of labor troubles which will interfere with the operation of factories consuming raw material and converting it into finished products. At present the utmost energy of the forces of production of the entire country is necessary to keep the channels of consumption supplied. It is likely that after the severe experiences of last year the employees in iron and steel works will not soon be disposed to try conclusions with their employers, but will endeavor to pursue their way peacefully and industriously. This view of the situation is justified by the agreements which have already been made for keeping mills in operation during the summer without stopping for the adjustment of the wages schedule for another year. If the same placidity was observed in other parts of the labor field the outlook would indeed be most assuring. The outbreak among the molders at Cleveland, however, seems to presage another period of interruption to the operation of foundries throughout the country. The Iron Molders' Union of North America expect to hold another of their national conventions this year, and it may reasonably be expected that a strong effort will be made to show those who gather in that convention that something is being done by the leaders for the welfare of the rank and file, and this can best be done through a strike of large proportions. The agitation of another strike in the machinists' trade has begun in Chicago, being directly fomented by the president of the International Associa-

tion of Machinists. He addressed a large meeting of members of local unions in that city on the evening of the 12th inst., stating that the movement for a nine-hour day would be renewed on May 1. He expected to complete this year the work begun last year. He made a declaration in favor of a straight nine-hour day, and said that a 54-hour week not divided into six days of nine hours was not satisfactory. He expressed the opinion that it would not be necessary to have a general strike, but professed to be convinced that through conciliation and arbitration the association would accomplish this purpose. In view of the fact that his association has kept up the fight on employers who refused to yield to their terms, it seems to be expected that another unpleasant experience is before such employers as have refused to permit the union to rule their shops.

Looking around still further, it is observed that the coal miners in some of the important Western coal fields, the engineers on lake vessels and other workmen in many lines are preparing for trouble. The events of the past week in Boston show how easily an apparently insignificant matter may develop into a most serious condition of affairs. It will take all the time and energy of the Civic Federation and other conciliatory agencies to tranquilize these uneasy forces or to secure a speedy settlement of differences when labor troubles break out. Otherwise, the number of persons finding 1902 a period of prosperity and individual advancement may be heavily reduced.

Decided expansion is going on in the malleable castings industry in the Northwest. Established malleable foundries have been greatly increasing their capacity during the winter, and quite a number of new ventures will also be made in this line. The disposition is particularly strong among large consumers of malleable castings to erect their own foundries, so that they may be independent of the outside market. As new foundries are at the same time being provided for the purpose of supplying the demands of just such establishments, it would appear that some danger exists of the malleable trade shortly showing an excess in productive capacity.

Mr. Swank's figures of the production of Bessemer steel ingots for the year 1901 are startling in their magnitude, showing as they do an increase from the banner year 1899 of 1,126,948 gross tons, while the increase over 1900 was 2,028,532 gross tons. To the 8,713,302 tons of Bessemer steel made in 1901 must be added the output of open hearth steel, for which the American Iron & Steel Association has not yet published the figures. In 1900 the production was 3,398,135 gross tons. It would be surprising if the two together for 1901 did not reach 12,500,000 gross tons—a stupendous total.

The Elmira Rolling Mill Company.—The Elmira Rolling Mill Company, Elmira, N. Y., recently incorporated with a capital stock of \$100,000, are building a new mill which will be equipped with a 10, 14, and 18 inch train, four Cahall waste heat boilers of 200 horse-power each, two 350 horse-power engines and will have an annual capacity of from 12,000 to 15,000 tons of refined bar iron. All the equipment except the engines, which have not yet been secured, has been purchased through David Townsend of Philadelphia. The officers are: E. E. Buchanan, president; Irving D. Booth, vice-president, and N. D. Doxey, secretary, treasurer and general manager. Other Elmira capitalists interested include M. H. Arnot, James B. Rathbone, John Brand, L. R. Johnson, E. G. Herendeen, Dr. Frank B. Darby, D. E. Rice and Jud H. Johnson.

CORRESPONDENCE.

Pig Iron vs. Scrap.

To the Editor: If the subject were not so serious there would be something almost comical in the consternation of the open hearth steel makers when awaking from the dream that the open hearth furnaces would become a formidable rival of the Bessemer converter in economy of production. There never was any good foundation for such an opinion. A single Bessemer converter, turning out 30 tons of steel per hour, or 300 tons in ten hours, has a manifest advantage in economy of fuel and labor over six 50-ton open hearth furnaces turning out the same quantity in 10 to 12 hours. As an offset to this, a strong reliance was placed upon the cheaper grades of iron, scrap and basic pig, that were to be used in the open hearth furnaces, and which were in excessive supply.

Not enough weight was given to the facts that the supply of these would not remain excessive if there should spring up a largely increased demand for them, and that the rapid multiplication of open hearth plants would create this demand. The demand has come and the country has been promptly swept bare of scrap, and the price of basic pig is as high as that of Bessemer pig, and is likely to remain so indefinitely.

The two prominent features of the situation are that the basic open hearth furnaces must rely chiefly upon basic pig at Bessemer prices for their material, and that the iron rolling mills which are in the pig iron districts must promptly provide themselves with puddling furnaces, and rely upon pig iron instead of scrap for the manufacture of iron bars.

The supply of scrap, supposed to be almost limitless, has proven to be ludicrously insufficient to provide for those two great interests in their present development; and the present necessity of the mills and furnaces is to provide themselves with material which can be purchased in quantity and in unfailing supply. The scanty and irregular production of scrap will not answer the requirements of large establishments, and the risk of stoppage for want of material cannot be incurred.

Evidently, it is no longer wise to erect open hearth plants with the expectation of running them on scrap; and the projectors of such plants should squarely face the fact that their work must, for the most part, be done with basic pig iron; and, similarly, the makers of merchant iron bars must provide themselves with puddling furnaces, in so far as their locations shall enable them to utilize forge pig iron in the place of scrap. T.

The Civil Engineers' Special Rail Committee.

At the last meeting of the Board of Direction of the American Society of Civil Engineers certain members of the society were appointed as a "Special Committee on Rail Sections." The duties of this committee as outlined in the ballot are as follows:

1. To report upon the results obtained in the use of rails of the sections presented to the society in annual convention, August 2, 1893, by a special committee appointed for that purpose.
2. To report whether any modification of any of said sections is advisable, and if so to recommend such modification.
3. To report upon the recognized practice as to chemical composition and mechanical treatment used in the manufacture of rails, and the manner of inspection of the same.
4. To report upon the advisability of the establishment of a form of specification covering the manufacture and inspection of rails.
5. If found advisable, to recommend a form of specification for the manufacture and inspection of rails.

The report of the Atlantic Mining Company shows that under the management of John Stanton the copper sold averaged 15.76 cents per pound during 1901.

Canadian News.

TORONTO, March 15, 1902.—W. G. Parmelee, Deputy Minister of Trade and Commerce, returned on Thursday from a visit to Sault Ste. Marie, Ont., whither he had gone to arrange for Government supervision of the output of the Algoma Iron & Nickel Steel Company's plant. Such supervision is for the purpose of ascertaining the amount of bounty earned for converting pig iron into the steel of which the rails are made. But the Deputy Minister found that the company were not yet on the point of producing rails or steel. The works, he reports, are not yet roofed over, unexpected delays having been encountered in the transportation of materials. He says that the company expect before long to be producing 500 tons of steel rails per day. The plant will permit of this rate of output being increased ultimately to 1000 tons. The Dominion Government is further interested in the enterprise because it has a contract with the company for rails to be used on the Intercolonial system.

Dominion Steel Bill.

The Legislative Council of Nova Scotia has passed the Dominion Iron & Steel Company's bill, with an amendment to the second clause providing that the new stock shall be first offered to holders of common shares before being offered to the public. In the Council an amendment was introduced providing that the payments of any dividend on any preferred shares from any source shall be without prejudice to the mortgage bonds, but this amendment was thrown out. This provision was introduced to modify section 3 of the bill, which stands thus:

"Notwithstanding any law of this province to the contrary, the directors of the company are hereby authorized to provide for the payment of any dividend on any preferred shares of the company from any source from which they could provide for the payment of or pay any interest on the company's mortgage bonds; provided, always, that the provisions of this clause shall only apply to such preferred shares of the company during the construction of the company's works at Sydney such time not to exceed two years from April 10, 1901."

Of course the Legislative Council's action is not final. The Legislative Assembly, the lower chamber of the Provincial Parliament, has to pass on the bill. It has been introduced in that chamber by Attorney-General Longley. No one can say in what precise form it will finally receive the concurrence of the two houses. Section 1 of the bill amends the charter of the company so as to read as follows: "The capital stock of the company shall be \$10,000,000, divided into 100,000 shares of \$100 each, with power to increase the same from time to time, as the wants of the company may require, upon a vote of a majority of the shares represented at a special meeting called for that purpose, or at any general meeting of the company."

This would enable the company to increase their capital to whatever amount they might at any time consider necessary.

Nova Scotia Steel & Coal Company.

It appears to be finally decided that the Nova Scotia Steel & Coal Company shall locate their blast furnaces at Sydney Mines. This decision, according to a Sydney dispatch to the *Halifax Herald*, was announced some days ago by Graham Fraser, managing director of the company, at a conference held at New Glasgow, with representatives of the Town Council of North Sydney. The choice is said to have been determined by the fact that both the company's coal mines and coke ovens are at Sydney Mines. It was deemed more advantageous to have the furnaces there, too. Work on the construction of a furnace is, it is said, to be begun at once.

A contract has been awarded for building a line of railway connecting the Nova Scotia Steel Company's present road with the proposed site of the blast furnaces.

Canada's Mineral Production in 1901.

The Geological Survey of Canada has issued its annual preliminary statistical statement of the mineral production of Canada for 1901. The total value of the metallic output is placed at \$42,824,698, and of the non-metallic at upward of \$20,000,000. In the latter \$14,

671,122 for coal is the chief item. The other large ones in the same group are asbestos, \$1,186,434; coke, \$1,264,360; petroleum, \$953,415. Of metallic product the output is put down as follows:

Copper (in ore or matte).....	pounds. 40,951,196	\$6,600,104
Gold (Yukon).....	.....	18,000,000
Gold (all other).....	.....	6,462,222
Iron ore exported.....	tons. 306,199	762,284
Pig iron from Canadian ore.....	tons. 83,100	1,212,113
Lead (contents of ores).....	pounds. 50,756,440	2,199,784
Nickel (in ore, matte, &c.).....	pounds. 9,189,047	4,594,523
Silver.....	ounces. 5,078,318	2,993,668
Total.....	.....	\$42,824,698

The total production of pig iron was, of course, a great deal more than the quantity put down above as the product of purely Canadian ore. In a footnote the total quantity of pig iron manufactured from domestic ore and from Newfoundland and American ore is stated to be 274,376 tons, valued at \$3,512,923.

The increase in value is 8 per cent. over the figures for 1900. An increase of nearly 30 per cent. was made in the quantity of nickel produced. Under the head of iron ore the following remarks are made in the report:

"Owing to the exploitation of the large deposit of ore of the Helen Mine, at Michipicoton, in Ontario, a considerable growth is evident in the country's production of this mineral. Part of the product goes to furnaces in Ontario, but the larger part is exported. Only the exports are credited in the table under this heading, the rest appearing under the item pig iron. Adding to the exports the 156,613 tons of Canadian ore charged to Canadian furnaces, we arrive at a total production of 462,812 tons.

"In the production of pig iron in Canadian furnaces an increase of over 184 per cent. is recorded, while the estimated production from Canadian ore alone increased nearly 135 per cent. These increases are due in a large measure to the successful completion and operation of the furnaces of the Dominion Iron & Steel Company, at Sydney, N. S. The Midland Furnace of the Canada Iron Furnace Company is also to be credited with a considerable portion of the increase, since they only commenced operations in the latter part of 1900. The various other furnaces continued operations on about the same scale.

"For obvious reasons the value of the steel product is not included in the general table. There was made, however, in steel furnaces in Canada during the year 41,948 net tons of steel ingots, &c., all of which was worked up into bars, &c."

Minor Notes.

W. E. H. Carter of the Ontario Bureau of Mines reports from Ryerson Station on the Canadian Pacific Railroad, that 300 men are at work in the Helen Mine under A. E. Buzzo, an experienced iron man from Michigan. About 1000 tons per day are being produced. This output is shortly to be doubled, as the result of approved appliances now installed. Diamond drilling goes on at the Josephine and Frances iron mines and on the Ontario Mining Company's properties.

The Gurney Foundry Company, who have large works in Toronto, have purchased a site on which additional works are to be erected in Toronto Junction.

W. Billingham, manager of the Malleable Iron Works, Montreal, has written to the Mayor of Ottawa stating that his company intend to remove their works to the latter city, on account of lack of room for expansion in Montreal, but he wants a bonus for the company and exemption from taxes. Three hundred hands would be employed.

Henry Goldmark, the new engineer employed by the Canadian Pacific Railway Company, says that the capacity of the new car shops of the company will be 25 cars a day, and that they will be the finest on the continent.

An arrangement has been entered into for operating the rolling mills in Belleville, Ont. It calls for 7000 tons of bar iron per year, the city giving a bonus and tax exemption.

C. A. C. J.

During 1901 the Cape Colony exported 2,539,059 carats of diamonds, valued at £4,930,104, as compared with 1,882,749 carats, worth £3,433,832, in 1900.

The Mineral Output of the World.

A most valuable report has just been issued under the able editorship of C. Le Neve Foster, and under the auspices of the Home Office of the British Government, in which is set forth very fully all the statistics relating to persons employed, output and accidents at mines and quarries, both in the British colonies and in all other countries. The object of this report is to compare the mineral industries of the United Kingdom and the British possessions with those of foreign countries, and to do this it has, of course, been necessary to collect figures from every country where mining and quarrying are carried on—in short, to compile the mineral statistics of the world. In the introduction Dr. Le Neve Foster points out how formidable has been his task. In the first place, some countries possessing a considerable amount of mineral wealth, such as China, with its huge coal fields, Persia, Turkey, the Argentine Republic, publish no mineral statistics whatever, while yet again certain European countries with large mining departments are extremely late in issuing their returns. The French statistics for 1900 were not received until Jan-

uary 6, while the Austrian and Russian returns are still incomplete for the year 1900. Another difficulty has been that some of the official reports published by British colonies or other countries have hardly suited the purpose of the compiler, who has had to wade through page after page of details before obtaining the essential facts. Dr. Le Neve therefore premises that, under existing conditions, it is practically impossible to compile a thoroughly satisfactory account of the mining statistics of the world, but none the less this report is one of the most valuable that has yet been issued, and should be in the hands of all those who make it a point to watch mineral developments in all parts of the world.

It is, of course, impossible within the limits of my space adequately to refer to all the useful information in this report. But by way of permanent reference I have extracted some of the most important figures. I append herewith a summary of the output of various minerals and metals in the British Empire and in foreign countries for the year 1900, so that it will be seen at a glance exactly what is the output for the whole world, country by country:

Summary of Output of Certain Minerals and Metals in the British Empire and in Foreign Countries During the Year 1900.

Country.	Coal. Metric tons.	Copper. Metric tons.	Fine gold. Kilos.	Iron. Metric tons.	Lead. Metric tons.	Petroleum. Metric tons.	Fine silver. Kilos.	Tin. Metric tons.	Zinc. Metric tons.
Great Britain and Ireland.....	228,794,919	777	415	4,741,835	24,556	.....	5,936	4,336	9,211
British colonies, dependencies and possessions:									
British Borneo.....	51,257	.....	684	.....	.....	.....	.....	.....	.....
British Guiana.....	.....	.....	3,002	.....	.....	.....	.....	.....	.....
British New Guinea.....	.....	.....	238	.....	.....	.....	.....	.....	.....
Canada.....	4,837,291	8,582	41,700	32,105	28,654	89,798	138,302	.....	97
Cape Colony.....	201,636	6,700	4	.....	.....	.....	.....	.....	.....
Cyprus.....	.....	20	.....	.....	.....	.....	.....	.....	.....
Federated Malay States.....	.....	.....	478	.....	.....	.....	.....	43,123	.....
Gold Coast.....	.....	.....	374	.....	.....	.....	.....	.....	.....
India.....	6,216,882	2	13,852	25,500	.....	151,546	.....	45	.....
Natal (adjoining Zululand).....	245,203	.....	.....	.....	.....	.....	.....	.....	.....
Newfoundland.....	.....	2,928	75	180,434	.....	.....	.....	.....	.....
New South Wales.....	5,595,879	6,310	8,746	.....	4,888	.....	315,261	925	4,100
New Zealand.....	1,111,546	1	10,541	.....	.....	.....	10,154	.....	.....
Queensland.....	505,110	340	21,027	.....	208	.....	3,514	742	.....
Rhodesia.....	.....	.....	2,860	.....	.....	.....	.....	.....	.....
South Australia.....	.....	5,400	603	.....	1,300	.....	311	8	9
Tasmania.....	43,700	9,766	2,244	1,549	13,347	.....	108,560	1,832	.....
Transvaal.....	.....	.....	14,704	.....	.....	.....	.....	.....	.....
Victoria.....	214,992	.....	23,647	.....	.....	.....	.....	45	.....
West Australia.....	120,310	630	43,297	6,220	51	.....	894	568	.....
Totals for British Empire.....	247,938,725	41,456	188,491	4,987,641	73,203	241,344	582,932	51,624	13,417
Foreign countries:									
Abyssinia.....	.....	.....	969	.....	.....	.....	84	.....	.....
Argentine Republic.....	.....	76	66	.....	.....	.....	11,930	.....	.....
Austria-Hungary.....	39,029,729	1,062	3,343	1,445,763	12,681	311,697	59,765	39	6,741
Bosnia and Herzegovina.....	394,515	500	.....	70,063	.....	.....	.....	.....	.....
Belgium.....	23,462,817	.....	.....	90,480	170	.....	.....	.....	3,225
Bolivia.....	.....	.....	3	.....	2,884	.....	496,480	6,720	.....
Brazil.....	.....	.....	3,529	.....	.....	.....	.....	.....	.....
Bulgaria.....	102,000	.....	.....	.....	.....	.....	.....	.....	.....
Chile.....	325,042	26,000	1,592	.....	13	.....	69,700	.....	.....
China.....	.....	.....	8,387	.....	.....	.....	.....	.....	.....
Colombia.....	.....	.....	2,723	.....	.....	.....	109,555	.....	.....
Corea.....	.....	.....	2,660	.....	.....	.....	.....	.....	.....
Costa Rica.....	.....	.....	234	.....	.....	.....	.....	.....	.....
Cuba.....	.....	.....	.....	224,945	.....	.....	.....	.....	.....
Ecuador.....	.....	.....	72	.....	.....	.....	240	.....	.....
France.....	33,403,736	201	1	1,772,000	16,993	.....	15,100	.....	31,500
Algeria.....	400	.....	.....	330,983	80	.....	260	.....	10,600
French Guiana.....	.....	.....	2,089	.....	.....	.....	.....	.....	.....
French Soudan.....	.....	.....	84	.....	.....	.....	.....	.....	.....
Indo-China.....	194,441	.....	.....	.....	.....	.....	.....	.....	.....
Madagascar.....	.....	.....	1,350	.....	.....	.....	.....	.....	.....
New Caledonia.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Senegal.....	.....	.....	112	.....	.....	.....	.....	.....	.....
Tunis.....	.....	.....	.....	.....	4,118	.....	.....	.....	5,800
German Empire.....	149,788,256	30,929	99	4,605,500	121,513	50,375	168,349	16	153,350
Greece.....	11,363	.....	.....	329,969	6,427	.....	32,137	.....	9,038
Holland.....	320,225	.....	.....	.....	.....	.....	.....	.....	.....
Dutch East Indies.....	196,206	.....	.....	.....	.....	127,610	.....	18,201	.....
Dutch Guiana.....	.....	.....	732	.....	.....	.....	.....	.....	.....
Honduras.....	.....	.....	17	.....	.....	.....	16,670	.....	.....
Italy.....	480,859	4,182	88	147,186	18,254	1,683	13,156	.....	48,000
Japan.....	7,429,457	25,304	2,130	21,299	1,877	86,200	58,953	12	.....
Luxemburg.....	.....	.....	.....	2,221,643	.....	.....	.....	.....	.....
Mexico.....	38,676	22,000	12,201	.....	75,413	.....	1,923,331	.....	180
Nicaragua.....	.....	.....	1,045	.....	.....	.....	.....	.....	.....
Norway.....	.....	4,406	4	2,448	.....	.....	4,598	.....	137
Peru.....	47,500	8,500	1,815	.....	180	36,640	265,700	.....	.....
Portugal.....	22,199	9,933	1	7,841	2,167	.....	.....	21	15
Portuguese East Africa.....	.....	.....	41	.....	.....	.....	.....	.....	.....
Roumania.....	86,000	.....	.....	.....	.....	385,000	.....	.....	.....
Russia.....	16,151,557	6,941	38,868	2,907,299	229	9,827,822	3,493	.....	5,967
Servia.....	112,237	270	.....	.....	283	.....	.....	.....	.....
Siam.....	.....	.....	.....	.....	.....	.....	.....	4,000	.....
Spain.....	2,674,105	74,739	19	5,626,410	203,744	.....	176,800	10	20,678
Sweden.....	252,320	827	.....	1,617,890	1,855	.....	2,200	.....	24,418
Switzerland.....	2,000	.....	.....	3,600	.....	.....	.....	.....	.....
Turkey.....	270,000	2,400	.....	.....	.....	.....	.....	.....	.....
United States.....	244,901,839	275,008	119,913	14,014,475	245,757	7,485,579	1,862,829	.....	112,419
Uruguay.....	.....	.....	49	.....	.....	.....	22	.....	.....
Venezuela.....	.....	.....	468	.....	.....	.....	.....	.....	.....
Totals for foreign countries.....	519,697,479	493,279	204,705	35,439,794	714,638	18,312,606	5,201,352	29,019	432,956
Totals for the world.....	767,636,204	534,735	393,196	40,427,435	787,841	18,553,950	5,874,284	80,643	446,373

A careful study of this table will repay itself. To begin with, it will be observed that, with the exception of tin, the British Empire, notwithstanding all its immensely rich possessions, is far behind the rest of the world in its output of minerals. It is a little astonishing, for example, to observe what a very small proportion is the British colonial output of coal compared with that of the mother country. The same remark applies with precisely the same force to the output of iron. When Great Britain herself produces 4,741,835 metric tons out of 4,987,641 metric tons, it at once becomes clear that in coal and iron the British colonies are not necessarily very valuable possessions. Judging by the output of fine gold, it would almost seem as if the British colonies have been founded by gold hunters, and I am not sure if this is not historically true so far as regards New South Wales, New Zealand, Queensland, Tasmania, the Transvaal, Victoria and West Australia. Before leaving Great Britain I append also a small table giving a summary of the metals obtained by smelting in this country. Again, it will be observed that iron is far and away the most valuable mineral product we have, and by inference, that if our iron industry is threatened or destroyed the results may be very serious:

Great Britain and Ireland.

Summary of the Metals Obtainable by Smelting the Various Ores Named.—1900.

Metal.	Quantity.		Value at the average market price.
	Statute tons.	Metric tons.	
Aluminum	560	569	\$72,800
Copper	765	777	59,995
Gold .....ounces.	14,004	kilos. 436	52,147
Iron	4,666,942	4,741,835	19,596,910
Lead	24,364	24,755	418,960
Silver .....ounces.	190,850	kilos. 5,936	22,465
Sodium	250	254	31,000
Tin	4,268	4,336	587,869
Zinc	9,066	9,211	188,573
Total values.....			\$21,930,719

Mineral Colonies of the British Empire.

Although, as will be seen from the first tabular statement, the mineral output of British colonies up to now has been small, it must not be assumed that there is a poverty of mineral land under the British flag. New South Wales seems to be exceedingly wealthy in this respect, particularly in coal, copper (both ingots, ore and regulus), gold, silver, lead and ore and other mineral properties. South Australia is rich in copper ore, which is by far the most important mineral in this colony. It is obtained chiefly from mines in Yorke's Peninsula in South Australia. The copper exported from South Australia in the year 1900 amounted to 4964 metric tons and was valued at \$1,850,000. Tasmania, again, while poor in coal, has large deposits of the ores of copper, lead, gold, silver and tin. It was the tin ore which first drew special attention to the mineral wealth of Tasmania, and for many years it was the principal mineral export. Mount Bischoff continues to be one of the largest tin mines in the world. In copper, Tasmania produced in the year 1900 of blister, 9533 metric tons, at a value of close on \$4,000,000, and of copper ore, 11,758 metric tons, valued at \$750,000; the tin ore amounted to 3041 metric tons, priced at \$1,330,000. It is stated in this report also that Western Australia is likely soon to become a large copper producer. The ores are being worked in the West Pilbarra gold fields and in the Mount Margaret coal fields, while numerous other deposits are known to exist. Tin ore again exists in large quantities in Western Australia, and there has been a marked increase in the output of tin, due to the development of the Marble Bar tin field and the Pilbarra gold district. The Green Bushes tin field in the southern part of the colony also shows improvement. The rich tin deposits in the Straits Settlements are, of course, known to all, but what apparently is not known is that in Uganda there is some chance of rich deposits being discovered. Sir H. H. Johnston, special commissioner to Uganda, says in a report: "As regards minerals, except that iron exists in most parts of the protectorate, and is easily worked by the natives, little is known of the existence of other metals. Copper is vaguely reported from

some of the Nile countries, but no precise information is at hand. In the same way, gold is said to be found by the natives in the gravel of river beds on the north-west of Lake Rudolph. In these respects the country has been so little explored that it is impossible to say whether it may turn out to be very rich in precious metals or very poor. Coal is reported to be found on the slopes of Mount Elgon."

S. G. H.

New Publications.

Power and Power Transmission. By E. W. Kerr, M.E., Assistant Professor of Mechanical Engineering, Agricultural and Mechanical College of Texas. Publishers: John Wiley & Sons, New York, 1902. Price, \$2.

This book, which is intended to direct the beginner along the proper course of study, is, as the author tells us, made up very largely from the subject matter of lectures delivered to students on the elementary principles of engineering. It is a neat octavo volume of 356 pages, and contains 264 figures. The first part, containing 13 chapters, is devoted to the consideration of machinery and mechanics treated in simple and elementary style, and at the end of each chapter there are a few problems for the student to work out, which he is supposed to be able to do, if he has intelligently read what precedes them. "Answers" to these problems are not given except in a few cases. When considering the mechanical powers, in the first chapter among them, the pulley or blocks and tackle is dealt with. The subject is treated in a somewhat conventional manner, and the examples all show the pull on the rope which comes to the hand of the operator as a negligible quantity so far as moving the weight is concerned. In pulling a weight along the ground, it is well known that the double block should be attached to the weight, and the single to the fixed point, and the pull exerted upon the "fall" rope will be multiplied by three, and not two, as in the case given where the double block hangs from the ceiling, and the single is attached to the weight. In Chapter V, the generally received laws of friction are discussed and compared with the more modern ones formulated after the experiments of Thurston, Tower and others. In the matter of screw threads, in Chapter IX, the table of United States standard threads is given in full, while the Whitworth table has been omitted, so that the student cannot make any comparison between the two systems.

Part two opens with a consideration of steam boilers, and the various classes of boilers are dealt with, the ordinary return tubular type, the Cornish type, the Scotch boiler, the locomotive boiler, the Babcock & Wilcox heater, the Heine boiler and the Stirling boiler are given. Among efficient steam producers the interesting construction of the Climax boiler might have been mentioned. Fuel and firing are taken up and much valuable information is given, though mechanical stoking comes in for only slight mention. Under the head of automatic cut off engines, the Corliss, Brown and Green, and under the subdivision high-speed engines, the Buckeye, Porter-Allen and the Ball & Wood are given. The theory of the indicator is taken up, and explanations of the "cards" and what they teach are made plain, though the curious reason why the pantograph is an efficient motion reducer is not brought out. A one-time "beginner" in looking back remembers when he did not grasp the supreme importance of the "diagonal" in the motion of the "lazy tongs." How to construct the theoretical expansion line, and the "why" for a particular number on the indicator spring, and how to combine high and low pressure cards from a compound engine, contain much practical information. Valves and valve setting gives the student a good idea of the subject in a general way, and this followed by the more theoretical consideration of valve diagrams. Rotary engines and steam turbines closes Part II, and is a brief but instructive survey of the subject.

Part III deals with pumps, gas engines, water power, compressed air, &c., begins with pumping machinery, explains the power pump, the accumulator, the air lift

method of raising water, the pressure gauge and the construction of the water meter. Under gas engines, the Otto and the Day are mentioned, with indicator cards from the Otto four-cycle type. Water power deals with wheels, turbines and jet machines. Compressed air and its various uses are briefly considered, a few words on hot air engines and a number of useful tables conclude the book.

The author does not pretend that he has exhausted the subjects treated of, but he has given data of value and has indicated the guiding principles, acting upon which the student may safely go forward with more thorough investigation. A student proficient in what Mr. Kerr has taught should go forth with confidence into the engineering field prepared to work and to learn.

Architectural Engineering. By John Kendall Freitag, B.S., C.E. Publishers, John Wiley & Sons, New York, 1901. Price, \$3.50.

"Architectural Engineering" is in its second edition, having been rewritten and almost doubled in size. It is a neat octavo volume of 405 pages dealing with high building construction. It contains a comprehensive index. This book illustrates the fundamental principles to be followed in the constructive design of modern skyscrapers. The half-tones and engravings number 196 in all, and it is a great convenience to the reader to find that they are excellently arranged, and are on the same page as the reading matter which they illustrate. The book opens with a definition of "Skeleton" and of "Cage" construction, and points out the advantages of the latter. A curious example of an early wrought iron girder used in building construction is given, which is interesting to the student of to-day. The girder was, in a sense, of I section and had been put in position in 1840, in Sedgwick Hall, Lenox, Mass. "The girders were made of three plates, a top and a bottom one, both horizontal, with a corrugated web plate between, the corrugations running up and down. These three pieces were fastened together with vertical bolts extending through the top and bottom plates, about 20 inches apart, and alternating, one on this side and the next on the other side of the vertical plate; the transmission of strains from the web to the flanges depending entirely on friction." A form of construction such as this gives, as it were, a datum line from which the progress up to and the practice at the present time can easily be measured.

The enormous loss of money owing to destructive fires, which in 1894 was said to have amounted to \$128,000,000, emphasizes the very great importance of fire protection in all our modern buildings, and this without touching upon the vital consideration of the safety of human life. Mr. Freitag gives a very complete summary of the notable fires in various cities in the United States and has clearly pointed out the invaluable lessons which these disasters have taught.

A chapter on "Typical Buildings" contains much interesting and useful information. "Floors and Floor Framing" deals with the subject of fire proof floors; the development of the flat arch with terra cotta arch blocks, and the proper protection of exposed floor beams; floor girders and the details used in connecting them together. In dealing with exterior walls and piers, he shows that the practice of concealing the steel work behind ornamental terra cotta in other incombustible material is not carried out from artistic or æsthetic considerations only, but arises from the absolute necessity for thoroughly protecting steel from the possible action of fire.

The author points out the utter unreliability of cast iron columns, instancing a building in Maiden Lane, New York, which was blown 11 inches out of plumb through the inability of cast iron columns to resist wind pressure. The formula used in proportioning cast iron columns is the one commonly called Gordon's or Treadgold's. The basis of this formula was a series of tests made by Hodgkinson somewhere about 1840, but the experiments were not such as to justify their use in any formula to be used in designing cast members for buildings. Up to 1899, however, Gordon's formula had practically been required by the New York

building law. Modern tests on full sized sections have since been made, and among other things they show the complete unreliability of the formulæ commonly employed. In this chapter the whole subject of steel columns is very fully covered, with many specific examples and detail illustrations.

In the matter of wind bracing the author gives, as he does in the record of fires, the lessons to be drawn from wreck and disaster caused by hurricane and tornado. He manifests here, as indeed he does all through the work, his feeling of responsibility for what he writes. His desire is to show a rational reason for good, conservative practice where safety is a prime consideration. High buildings are, comparatively speaking, very modern structures, and their liability to stand indefinitely is a matter which can only be demonstrated by time. It should, therefore, be the architect's first endeavor to incorporate in his practice all that experience and the study of others' methods has shown will make most surely for endurance against the assaults of fire, hurricane and earthquake from without and resist the slower and more insidious attacks of corrosion from within; so that, having taken reasonable precautions, it may be said of his reputation and of his building, in the words of St. Paul, "and having all, to stand."

In the chapter on "Foundations," underpinning, grillage, masonry, rail and other footings, pile foundations, pipes, and pneumatic caissons are some of the subjects taken up in detail. The last chapter is on "Specifications and Inspection," under which head much valuable information is given. A warning note is sounded as to the dangers of cheap or restricted inspection of material and work. In this, as in other things, the old adage is true, "eternal vigilance is the price of safety."

This book should be of value to architects, engineers, draftsmen, builders, inspectors, students, and to those interested in building design and construction. It might also be helpful in courses of study in architectural or technical schools.

The Use of the Slide Rule. By F. A. Halsey, Associate Editor *American Machinist*. Publishers, the D. Van Nostrand Company, 23 Murray street, New York, 1899. Price, 50 cents.

The preface tells us that this little book of 84 pages is mainly a reprint of articles which originally appeared in the *American Machinist*. The writer confesses to being an habitual user of the slide rule, who would almost as soon think of dispensing with a lead pencil as with the rule. It is, in his opinion, the greatest mental labor saver that has ever been devised.

It is based upon the theory of logarithms, but to make satisfactory use of the rule a knowledge of logarithms is not necessary, though Mr. Halsey's explanation of the principle upon which it operates is most helpful to those who use it in order to escape from the drudgery of mathematics. A brief examination of the "how" and "why" of the process may be in order, to understand what the book endeavors to accomplish. The first problem is to multiply 2 by 3; the product is, of course, 6. It is well known that the logarithm of 2 added to the logarithm of 3 will give the logarithm of 6. The slide rule is divided into a number of spaces, varying in length, but corresponding to the logarithms of the digits. To solve the problem before us, the procedure is to set 1 of the slide scale below 2 of the body scale, and above 3 of the slide scale will be found 6 on the body scale. The distance from 1 to 2 on the body scale is really the logarithm of 2, and the distance from 1 to 3 on the slide scale represents the logarithm of 3. The logarithms of 2 and 3 added give the logarithm of 6, which is read as a natural number direct from the scale on the body of the rule. The user has in this example employed natural numbers, which the slide rule with its unequal divisions has translated into logarithms, added them together, and, so to speak, having performed the purely mathematical part of the work, gives the answer in natural numbers. The book deals with mechanical addition as performed by the rule, multiplication of fixed numbers and the multiplication of fractions; in short, all the various mathematical operations which engineers, architects or draftsmen are constantly

called upon to perform are explained. The use of the "runner," which is an adjunct of the rule, is also made clear.

The limit of error of the slide rule, when of usual size, is about one-half of 1 per cent. This is well within the limits of permissible error in most engineering calculations, and is, as Mr. Halsey says, aside from this margin of error, more reliable than mental calculations.

The illustrations, some 18 in number, are on wide pages folded in at the back of the book. When opened out these illustrations lie beyond the printed page, so that they are always before the eye, no matter how many pages may be turned in reading the explanations of the cuts. This is the best plan of placing diagrams before the reader of which we have any knowledge, and is a convenient feature in the book which will not fail to be greatly appreciated by the student. This device, like the slide rule itself, is a time and labor saver.

The World's Production of Spelter.

We are indebted to the American Metal Company of New York for a copy of the statement of the production of spelter in the world, compiled by Henry R. Merton & Co., Limited, metal merchants, of London. The statistics of the production of spelter for the United States were collected by the American Metal Company:

	1901. Tons.	1900. Tons.	1899. Tons.	1890. Tons.
Rhine, Belgium and Holland	199,285	186,320	189,955	137,630
Silesia	106,385	100,705	98,590	87,475
Great Britain	29,190	29,830	31,715	29,145
France and Spain	27,265	30,620	32,955	18,240
Austria and Italy	7,700	6,975	7,190	7,135
Poland	5,935	5,875	6,225	3,620
	375,760	360,325	366,630	283,245
United States of America	122,830	110,465	115,855	59,371
Totals	498,590	470,790	482,485	342,616

It will be observed that our percentage of the world's total production has risen from 17.3 per cent. in 1890 to 24.6 per cent. in 1901.

The Cleveland Molders' Strike Declared Off.—After an eight-hour conference, held March 15 between representatives of the National Founders' Association and the Molders' Union, the strike in the Cleveland foundries was declared off. By the terms of the agreement arrived at an advance of 15 cents per day is to be paid to the molders, making the minimum wage paid \$2.90 per day, the higher priced men to receive an increase accordingly. The agreement is for one year. Later the agreement was ratified by both organizations and the men returned to work on Monday. Although they won the strike of last year, the policy of the foundrymen in the present difficulty has been very conciliatory. In response to the first demand for a minimum scale of \$3 per day, the foundrymen offered a variable scale giving certain men higher wages than others. This was refused, and the employers offered a minimum of \$2.85 per day, the figure for which the men struck two years ago. This offer was refused and the strike resulted. Both parties are pleased with the result of the controversy, as it removes all troubles for another year. It is believed that the threatened difficulty with the core makers will now be speedily adjusted.

Information Wanted.—Who produces open hearth round steel disks of from $\frac{3}{8}$ to $\frac{1}{2}$ inch in thickness, and from 10 to 14 inches in diameter, and having a tensile strength of not less than 70,000 pounds per square inch, and of from 25 to 40 points carbon? These disks could be either punched or rough sheared. The $\frac{3}{8}$ -inch disks would be required in lots of 1000, the $\frac{1}{2}$ -inch disks in lots of 100.

Whatever may be the effect of the litigation pending between the recently organized Standard Steel Car Company and the Pressed Steel Car Company of Pittsburgh over certain patents, it is said there will be no delay in the building of the new plant of the Standard Steel Car Company, which will be located either in Vanport or Beaver, Pa. It is claimed nearly all the plans for the new works have been completed, and that construction will start in a short time and will be pushed vigorously.

MANUFACTURING.

Iron and Steel.

At the Sharon Works of the National Steel Company, Sharon, Pa., six more gas producers are being built and a large new machine shop will soon be erected. A 2,000,000-gallon pump is being erected at the general water station and some other modern improvements are being made. A. Trinius is superintendent of the plant.

We may state on official authority that the report that Henry Wick, Robert W. Taylor, Myron G. Wick and other capitalists of Youngstown, Ohio, were interested in a large new steel plant to be built in that city is utterly without foundation.

It is possible that the Sweet's Steel Company, Syracuse, N. Y., will erect a new steel plant in the west end of that city.

Wallace Buell, manager of the commercial business of the Dominion Iron & Steel Company, Limited, Sydney, Nova Scotia, has been at the company's office, 100 Broadway, for a few days. Mr. Buell reports success in the starting up of their large open hearth basic steel plant. The first ingot rolled as perfectly as though the mill had been in continuous operation for several years, and with the exception of only one heat the large production since has been regularly within the standard requirements for open hearth basic. The furnaces are successively going into commission as fast as they can be made ready, and by summer the whole plant of ten 50-ton furnaces, with a daily output of about 1000 tons, will be under full headway.

We are advised that the 35,000 tons of angles which the Bethlehem Steel Company of South Bethlehem, Pa., are to roll for the American Bridge Company will be rolled on the old rail mill, known as Mill No. 2.

The Knoxville Iron Company, Knoxville, Tenn., have awarded the contract to the Virginia Bridge & Iron Company for the erection of the steel buildings for their new \$500,000 plant. Work of construction will be started as soon as weather permits, and it is expected that the plant will be in full operation by August. Cahall waste heat boilers and such other modern machinery as is necessary for a complete works have been purchased.

The Sargent Company of Chicago, heretofore operating an open hearth steel plant at Fifty-ninth street for the manufacture of draw bars, knuckles, coupler parts for repairs, and a plant at Chicago Heights, Ill., for the manufacture of Tropenas steel castings and steel and iron brake shoes, have transferred the plant at Chicago Heights, together with the classes of business done there, to the American Brake Shoe & Foundry Company, which company will hereafter conduct the business of this department from their offices at Chicago Heights. The Sargent Company will continue the operation of the open hearth steel plant at Fifty-ninth street, where their general offices will be located. They are having plans drawn and specifications prepared for an extension to give them approximately three times the capacity of their present plant.

The Massena Electric Steel Company, recently incorporated with a capital stock of \$500,000, will erect a 100-ton electric furnace at Massena, N. Y., the power to be supplied by the St. Lawrence Power Company. It is expected that the furnace will be making steel in June. This company will operate under patents of the Electric Steel Company of 52 William street, New York City, which is also the Massena Company's office. The officers and directors are W. B. Hutchinson, president; M. B. Conley, vice-president; Burnell Colson, secretary; Thomas T. Seelye, treasurer, and David Parks Fackler.

W. C. Runyon of the Struthers Furnace Company, operating a blast furnace at Struthers, Ohio, is considering the question of building a plant of beehive coke ovens at Struthers, to supply his furnace with coke. It is probable that about 100 ovens will be built, which will require 350 tons of coal per day.

The Maryland Steel Company are building at Sparrow's Point, Md., 200 by-product coke ovens of the Otto-Hoffman type. These are pretty well under way and are expected to be finished by September next. The coke made will be used in the blast furnaces of the Maryland Steel Company at Sparrow's Point.

The Ohio Falls Iron Company, New Albany, Ind., are making a very important addition to their rolling mill plant. They are erecting buildings which will cover a ground space of 300 x 540 feet. The new equipment will consist of a 20-inch three-high muck mill, a 60-inch squeezer and a 14-inch Belgian mill with 10-inch finishing rolls for light rails. The power plant will consist of six 250 horse-power Cahall boilers, one 28 x 48 Corliss engine and one 24 x 48 Corliss engine. Auxiliary machinery will be provided, such as five new shears, cold saws, straightening machines, &c. The improvements will increase the company's output to about 60,000 tons per annum.

The new tube plant of the Eastern Tube Company, at Zanesville, Ohio, is in full operation, turning out about 400 tons of pipe daily.

It is said that the new car wheel plant to be built by Charles T. Schoen and others of Pittsburgh will be located on a plot of 40 acres above West Elizabeth, on the Monongahela River.

General Machinery.

The Jackson Flour Mill Machinery Company, Jackson, Mich., have been reorganized with \$1,000,000 capital stock, under the

name of the Flour & Cereal Machinery Company, Limited. The new company will remove their business from Jackson to Battle Creek, where they will erect a larger plant, consisting of a main building, about 75 x 200 feet, and a foundry, 50 x 75 feet. About all the new equipment that will be required will be a 50 horsepower Corliss engine. The company will make a full line of machinery for the manufacture of flour and cereal food products. The officers are James F. Crane, president; Geo. A. Douglas, vice-president; W. H. Stanley, secretary; Frank Abbey, treasurer, and Henry P. Crockett, superintendent.

The Terre Haute & Indianapolis Railroad Company, Terre Haute, Ind., will commence the construction of a new machine and repair shop, 70 x 120 feet, at Logansport, Ind., as soon as the frost is out of the ground.

The Ramsey Electric Mfg. Company of Pittsburgh have been awarded a contract for the installation of a new electrical plant at Cumberland, Md.

The Walsh Boiler & Iron Works, Springfield, Mass., are in the market for a good second-hand combination punch and shears with 42-inch throat.

The Vacuum Dyeing Machine Company, Chattanooga, Tenn., were recently incorporated under the State laws of Tennessee. They will manufacture a patent dyeing machine. The work is accomplished by means of forcing dye liquor through the goods by a steam pump.

The Nixon Ratchet Mining Drill Company, Chattanooga, Tenn., intend to commence manufacturing a new patent mining car.

Charles H. Besly & Co., 10 and 12 North Canal street, Chicago, are finding the users of Gardner grinders throughout the country very liberal in their orders for spiral circles, as they report that spiral circles made from emery, corundum or carborundum will do much more work than any other known grinding surfaces. They are receiving many orders for these grinders, recent shipments having been made to California, Washington, Oregon, Wisconsin, Ohio and Pennsylvania. They have further enjoyed a large business from the Pacific Coast for their Helmet oil and Badger and Bonanza cups. General trade in manufacturers' and machinists' hardware continues very good.

The Charles F. Elmes Engineering Works, Chicago, report a heavy inquiry for presses. They have just shipped a 600-ton press to Pasadena, Cal., which is to be used for pressing the oil from lemon peelings, and also a 200-ton press to another Western point for pressing herbs.

The Clyde Iron Works, Duluth, Minn., will shortly begin the erection of a new plant, which the growth of the business of the company demands. They propose to build two buildings, one of which will be three stories high, 40 x 100 feet, and the other will be one story high, 40 x 195 feet. The company have prospered greatly from the increase in the navigation interests on Lake Superior, from which they derive a large part of their business.

The Marine Iron Works, Chicago, Ill., are now running full in their new shops with entirely new and remodeled equipment and plant. The wisdom of greatly increasing their capacity is already being demonstrated, as every department of the works is overcrowded with orders. They have just closed a contract for a large amount of machinery for the Tabasco-Chiapas Trading & Transportation Company, one of the great commercial companies doing business in the tropics. Among other notable pieces of work is the complete equipment of a fine river steamer for the Zaragoza Mining Company, operating on the Magdalena River in the United States of Colombia. They have also several steel boats under contract to be erected according to the ingenious plan of "knock down" construction, which the Marine Iron Works have developed. The advance pages of their 1902 catalogue have been received, and besides very interesting data and illustrations of the engines that they build, contain several pages descriptive of the "knock down" method of building boats. How far afield the business of this company reaches is illustrated by the fact that they are at present doing work for Constantinople, for the Saskatchewan, Venezuela, Colombia and Brazil, as well as all over the United States.

The Penberthy Injector Company, Detroit, Mich., have purchased a tract of five acres on Greenwood avenue near Holden, in the city of Detroit, which will be used as a site for a plant which they propose to erect as speedily as possible. The location is well adapted for the purpose, having railroad facilities. The new plant will be considerably larger than the company's old works. The jury who have been investigating the recent boiler explosion which wrecked their old plant and killed 30 persons have returned a verdict completely exonerating the company and their engineer from all responsibility and placing all responsibility for the disaster on the makers of the boiler. This frees the company from liability in damage suits.

The Wm. H. Leister Mfg. Company, Baltimore, Md., have incorporated for the purpose of manufacturing can labeling machines, which for the present they are having built by contract. Later on they expect to have a plant of their own.

The Brooks Tire Machine Company, Wichita, Kan., intend to considerably enlarge their present plant.

The corporation papers of the South St. Louis Foundry, St. Louis, Mo., manufacturers of engines, boilers, rock and ore

crushers, gray iron castings, etc., having expired, the company have been reincorporated for a period of 15 years.

The New Britain Machine Company, New Britain, Conn., contemplate building a new machine shop.

The United Engineering & Foundry Company of Pittsburgh have recently received a contract for a 40-inch blooming mill, to be installed in the Brown-Bonnell Works of the Republic Iron & Steel Company, at Youngstown, Ohio. This mill will be built in the Lloyd-Booth Department of the United Engineering & Foundry Company at Youngstown.

It is reported that the Big Four Railway Company are planning the erection of large repair and machine shops at Springfield, Ohio, the idea being to abandon the present shops at Sandusky and Delaware, Ohio.

The United States Gypsum Company are planning to erect an extensive plant in Toledo. It will be equipped with electrically driven machinery.

The Toledo & Indiana Railway Company of Toledo, who are building an electric line, have awarded contracts to the American Bridge Company for nine steel bridges and to the Cambria Steel Company for 2200 tons of steel rails. They are preparing plans for their power house, car barns, and repair shops.

The C. O. Bartlett & Snow Company of Cleveland have been incorporated with \$60,000 capital stock by K. F. Snow, C. O. Bartlett, J. M. Snow, Jacob Majetk and M. B. Taffe. The company have succeeded C. O. Bartlett & Co., manufacturers of mill, hoisting machinery, boilers, &c. The new company will extend the business and will make improvements.

The Columbia Telephone Mfg. Company, at present of Chicago, have reorganized with \$250,000 capital stock, and will remove their plant to Ottawa, Ohio. A building, 200 x 50 feet, two stories, and a wing, 100 x 50 feet, two stories, will be erected as soon as possible. A modern power plant and new machinery will be installed.

At a conference held March 16 between officials of the Morgan Engineering Company, Alliance, Ohio, and a committee of the striking machinists, an agreement was reached and the 320 employees affected, returned to work the next day. It is understood that under the terms of settlement the shop will be an open shop, with time and a half for overtime and Sundays; Sunday work to be optional. The strike has been on for three weeks, and the company were preparing to operate with imported men.

The West Penn Foundry & Machine Company, Avonmore, Pa., were awarded the contract for furnishing the machinery for the new plant of the St. Louis Plate Glass Company, St. Louis, Mo. Wilson & Snyder, Pittsburgh, were awarded the contract for cranes and derricks, while Heyl & Patterson will install all the conveying machinery required in the plant.

The John R. Morgan Engineering & Construction Company of Columbus, Ohio, recently incorporated, will build at once a thoroughly modern plant of large capacity, in which will be manufactured cranes, elevating and conveying machinery and ore hoisting and handling machinery. It is expected the plant will be in operation in from six to nine months. A large tract has been bought at Broad street and the Big Four Railroad, Columbus. The machine shop will be 240 x 100 feet. All will be equipped with the latest tools, electrically driven. The company expect to be in position to handle the largest contract work. The officers, several of whom have been connected with Columbus and other engineering plants, are as follows: Edward Ackland, president; John R. Morgan, vice-president and general manager; William G. Hildebran, assistant manager; Gilbert D. Preston, treasurer; Robert B. Bryson, secretary; Charles F. Newirth, engineer.

Bridges and Buildings.

The Whitehead & Kales Iron Works, Detroit, Mich., engineers and contractors in structural steel and iron, have secured a site at Foundry street and the Michigan Central Railroad, where they will erect a new plant. The buildings will cover an area 100 x 220 feet, and the yard room for the storage of beams, channels and structural material will be 150 x 220 feet. Both will be equipped with complete service for the handling of heavy material.

The Fort Pitt Bridge Company of Pittsburgh, with works at Canonsburg, Pa., have been given a contract for the erection of a large steel frame building for the Fischer Foundry & Machine Company, South Side, Pittsburgh.

The Jeffrey Mfg. Company of Columbus, Ohio, have secured a permit to erect a brick and steel building, 350 x 110 feet.

Calvin Whiteley, Jr., chief engineer, Richmond Passenger & Power Company, Richmond, Va., advises us that the preliminary work has been started upon the plans for the proposed bridge over the James River between Richmond and Manchester. The bridge is to be 2000 feet long, probably of the girder type. Estimated cost, including granite foundations, will be \$150,000.

Foundries.

The strike of the molders employed in the foundry of Fairbanks, Morse & Co., Beloit, Wis., was amicably settled last week, and the men have returned to work.

Local capitalists of Oshkosh, Wis., have for some time been considering the advisability of the erection of a malleable cast-

ing plant. They have finally decided to build a foundry and a company will be organized under the name of the Ferris-Clevis Company. It is reported that W. A. Driver of Racine will manage the enterprise. The proposed capitalization is \$20,000.

The Chandler Pump Company, Cedar Rapids, Ia., will replace their old foundry with a modern brick and steel foundry building, 75 x 100 feet. A storage room will also be erected near the new building. With the exception of an elevator and probably a couple of electric motors, no new equipment will be required.

The Old Colony Foundry Company, East Bridgewater, Mass., iron and brass castings, have purchased the Dean foundry, which they will operate in connection with their present plant. A number of improvements will be made to the new property.

The M. B. Schenck Company, Meriden, Conn., manufacturers of casters, have secured the Breckenridge foundry, located near their plant, and are fitting it up for the manufacture of small gray iron castings for their own use.

The Novelty Iron Company, Canton, Ohio, makers of hot water and steam boilers, advise us that they have not as yet made any plans for rebuilding the part of their plant which was recently destroyed by fire, but expect very soon to have things in shape to do so. The foundry and core departments only were destroyed, the machine and pattern departments and warehouse remaining intact, so that with arrangements already made with outside parties they will be able to take care of their customers with but little inconvenience.

The Vulcan Foundry & Machine Company, New Castle, Pa., manufacturers of iron castings and specialties in mill machinery, advise us that E. E. McIntyre, formerly manager of their Pittsburgh office, is no longer connected with their concern, but has been succeeded by C. W. Lytle.

The firm of Wigham & Magor, 29 Broadway, New York City, have incorporated as the Wigham-Magor Engineering Works, with a capital of \$20,000. As announced in these columns recently, they intend to erect a new shop for the manufacture of small steel cars, portable track and industrial railway equipment.

The Dayton, Ohio, water works department is calling for proposals on 500 tons of cast iron water pipe and special castings.

The Deming Company of Salem, Ohio, manufacturers of pumps and hydraulic machinery, have of late experienced such an increase in the amount of their pump business that they have been hampered for foundry room. They are preparing plans for an addition 60 x 80 feet. Heretofore they have sent much of their heavy work to other foundries, but will now do all their own work in this line.

The Caldwell Furnace Company of Toledo have been reorganized and incorporated under the laws of New Jersey with \$300,000 capital stock. The company have purchased a large foundry and furnace at Fort Payne, Ala., which have been consolidated under one head with the old Smead plant in Toledo. At the Toledo plant the company are manufacturing blowers, fans, galvanized pipes, as well as furnace castings. It is stated that both plants will be enlarged.

The directors of the recently organized Sharon Foundry Company have decided to build a new foundry and ingot mold plant at Wheatland, Pa. Work will be started in a short time and the main building will be 450 x 120 feet.

Engines, Boilers, Etc.

The Boston & Northern Street Railway Company, 14 Kilby street, Boston, Mass., have purchased a site at Danversport upon which they propose to erect a large power plant.

The Morris Sherman Mfg. Company, Chattanooga, Tenn., were organized January 1, and are about to be incorporated under the State laws of Tennessee. Their general line of manufacture will be marine and stationary boilers, refuse burners, tanks, towers, and stand pipes. They intend to erect a plant.

The Walsh Boiler & Iron Works, Springfield, Mass., whose plant was recently destroyed by fire, are building a temporary shop to tide over the summer season. They have recently purchased a 50 horse-power motor from the Milwaukee Electric Company, through their New York agent, Mr. Bunton, and a radial drill from the Prentiss Tool & Supply Company.

The Milwaukee Rice Machinery Company, Milwaukee, Wis., manufacturers and jobbers of pulleys, shafting, power transmitting appliances, leather belting, gas and gasoline engines, &c., have increased their capital stock to \$100,000, to take care of their rapidly growing business. They intend to enlarge their engine department.

Peter S. Gilchrist, chemical engineer, Charlotte, N. C., under whose supervision a large fertilizer plant is being erected at Nashville, Tenn., by the Federal Chemical Company, of Louisville, Ky., advises us that none of the contracts have been let for the equipment. They are in the market for about 200 horse-power of engines, divided into two units, 120 horse-power Corliss engine, the balance high speed for electric power; 240 horse-power of boilers, in three units, grinding machinery, &c. The plant will consist of a main building, 160 x 500 feet; acid house, with chambers of 70 tons capacity daily; engine and boiler house, electrical machinery house, pumping station, storage house for nitrate of soda, offices, also dwelling houses for officials and clerks, the whole covering 21 acres of ground.

P. B. Canfield, Binghamton, N. Y., manufacturer of gas and gasoline engines, is enlarging his plant and installing some new machinery, most of which was purchased from the Syracuse Supply Company, Syracuse, N. Y.

The Domestic Engine Company, Hagerstown, Md., manufacturers of gas and gasoline engines, contemplate enlarging their plant.

The Niles Boiler Company, Niles, Ohio, recently found it necessary to lay off a few of their men on account of not being able to obtain material quickly. The local union objected to this and demanded that some of the men be reinstated at once. The firm refused to do this, and the result is a slight labor trouble has developed. It is probable, however, the matter will be adjusted within the next few days. J. H. Orwlf has severed his connection with the above concern and E. A. Gilbert, engineer, has been made secretary and superintendent.

E. Worthington, 402 Cuyahoga Building, Cleveland, is offering for sale the plant of the Metal Goods Mfg. Company, Cleveland, consisting of brick building, 275 x 50 feet, and equipped with Corliss engine, lighting plant and boilers and shafting. The company are closely identified with the Kirk-Latty Mfg. Company, and they are desirous of combining the two interests in adjoining factories.

The Standard Bolt Mfg. Company, Alliance, Ohio, recently organized, advise us that they are in the market for boilers and engines of about 150 horse-power, shafting, belting, pulleys and hangers, lathe, planer, drill press and a few other machine shop tools. They have awarded the contract for the erection of the main building, 70 x 208 feet, and boiler house of their proposed new plant. A full line of bolt, nut and rivet machinery has been purchased from the Acme Machinery Company of Cleveland. The officers and directors are: W. K. Fogg, president; P. M. Haas, vice-president; E. E. Scranton, secretary and treasurer; J. C. Devine, Geo. W. Sturgeon, and H. H. Shafer.

Fires.

W. G. Roberts' machine shop, at Fox Lake, Wis., was destroyed by fire March 14. Loss is about \$5000.

The plant of the W. D. Williams Foundry & Machine Company, Fredericksburg, Md., was recently destroyed by fire. Loss is about \$25,000, with \$20,000 insurance.

The repair shop of the Maine Central Railroad Company, at Thompson's Point, Portland, Me., was damaged by fire last week. The loss is about \$15,000.

The five-story building at 23 and 25 Randolph street, Chicago, Ill., occupied by Sidney Shepard & Co., dealers in tin plate and metals, was destroyed by fire last week. The loss will aggregate \$80,000.

The mill of the Laffin & Rand Powder Company, near Columbus, Kan., was wrecked by an explosion March 15. The loss will reach \$10,000, not including the powder.

F. L. Moore's Sons Company's foundry on Front street, Elizabeth, N. J., was destroyed by fire March 18. The loss is about \$15,000.

The New Orleans Cotton Seed Oil Mills, New Orleans, La., were burned March 18; loss about \$80,000.

The Farist Steel Company, Bridgeport, Conn., suffered a \$40,000 loss by fire at their plant on East Main street last week. Valuable patterns and machinery were destroyed.

The plant of the Noble & Johnson Machine Company, Hoosick Falls, N. Y., manufacturers of paper mill machinery, was destroyed by fire March 15. The loss is about \$50,000, partly covered by insurance.

Hardware.

The Hickman Scale Mfg. Company, Des Moines, Iowa, have filed articles of incorporation. The company will manufacture scales of many kinds and are capitalized at \$10,000. James W. Hickman and Chas. F. Boehler are the incorporators.

The New England Lock & Hinge Company are about making alterations and additions to their plant at Centerville, Mass., which will not only facilitate the filling of orders, but give them much needed room. What was formerly used by Wendell P. Clark & Co. for a paint room will be occupied by the company for the painting of their steel toys, and in the room gained by the transfer of this branch of their business power sewing machines will be installed for the stitching of sails for the thousands of toy boats annually manufactured, thus giving employment to girls.

The Syracuse Machine Company, Syracuse, N. Y., have been incorporated with a capital of \$20,000. The directors are Louis A. Sherbano, Frank E. Allen, William H. Porter, August Flinck, Jr., and Joseph N. Austin, all of Syracuse. The company will manufacture meat grinders and other hardware specialties. They expect to start operations about April 1 and will employ 20 men.

Housatonic Company, Wallingford, Conn., have secured an option on a tract of land on Blatchley avenue, in Fair Haven, Conn., and will erect a plant there if the city will lay a sewer through the streets. The company, capitalized at \$200,000, are a consolidation of the Eagle Spool Company of New Haven and the Housatonic Company of Wallingford. The corporation manufacture spoons, knives, forks, brass goods and hardware specialties, and they propose to erect a plant which will accommodate 200 hands.

PERSONAL.

The Handlan-Buck Mfg. Company of St. Louis, dealers in railway supplies, announce the appointment of J. W. Copeland of Denver, Col., as their exclusive representative in that territory. Mr. Copeland is also sales agent of the Braeburn Steel Company of Braeburn, Pa., manufacturers of tool steel.

R. A. Hammond has recently been elected president and treasurer of Durable Wire Rope Company, Boston, Mass.

F. H. Miller, second vice-president and sales manager of the Columbus Iron & Steel Company, has been confined to his home for the past week on account of illness, and at this time his condition is considered quite serious.

H. G. Merry, for many years manager of the Lowmoor Iron Company of Virginia, has accepted the position of general manager of the Montana Coal & Coke Company.

Thomas A. Harris has been elected secretary of the Sharon Steel Company to succeed V. Delamater. Mr. Delamater has connected himself with the Youngstown Foundry Company, at Youngstown, Ohio.

Charles E. Dinkey, assistant superintendent of the Edgar Thomson steel works and blast furnaces, has gone to Florida.

W. R. Balsinger of the armor plate department of the Carnegie Steel Company has gone to California, to be absent for several months.

W. C. Magee, general sales agent of the H. C. Frick Coke Company, at Pittsburgh, has gone to California for an extended visit.

J. C. William Greth, formerly connected with the Pittsburgh office of the Frick Company, builders of engines, &c., Waynesboro, Pa., has accepted a position as manager of the purifying department of the William B. Scaife & Sons Company, Pittsburgh.

J. H. Orwig has resigned the management of the Niles Boiler Company, Niles, Ohio, and is succeeded by E. A. Gilbert, who has been elected secretary and superintendent.

Benjamin Talbot, the inventor of the continuous open hearth process which bears his name, is now on his way from England to this country.

The Otis Elevator Company.—The Otis Elevator Company report for the year ended December 31 last: Net earnings after deducting all charges for interest and patent expense, and for renewals and repairs for maintenance of plant, \$842,096. Deduct dividends on preferred stock, \$267,538; balance, \$574,558; charged off for depreciation, \$274,558; surplus added to working capital, \$300,000. The condensed balance sheet as of December 31 shows: Assets.—Plant account, \$10,520,891; cash, \$104,838; bills receivable, \$65,957; accounts receivable, \$1,827,509; inventories, \$1,150,893; total assets, \$13,670,088. Liabilities.—Preferred stock, \$4,499,800; common stock, \$6,350,300; gold notes at 4 per cent., due January 1, 1903, \$150,000; due January 1, 1904, \$150,000; due January 1, 1905, \$150,000; due January 1, 1906, \$400,000; due January 1, 1907, \$200,000; due January 1, 1908, \$200,000; total gold notes, \$1,250,000; bills payable, \$350,000; accounts payable, \$452,492; preferred dividend No. 12, due January 15, 1902, \$67,495; surplus, \$700,000; total, \$13,670,088. President W. D. Baldwin of the Otis Elevator Company in his annual report says: "Your directors report that the result of the company's business for the year 1901 has been satisfactory. The large amount of building operations throughout the country has made the demand for your company's product during the past year larger than at any time in the history of the company, and the outlook for the present year is most encouraging. While the net earnings, as will be seen from the foregoing statement, apparently justify some recognition of the common shareholders in the way of dividends on the common stock, your directors are of the opinion that the ultimate best interests of the company and all its shareholders will be subserved by carrying the surplus of \$300,000 to the working capital

account. The expenditure of large amounts of money in betterments and in expanding the operations of your company in various ways since the organization of your company, has necessitated in the judgment of your directors that the working capital should be increased until such time as it is sufficient to meet the demands of the business. From the present indications the growing demand for your company's product, and further expansion of your company's business, will require a continuance of this policy for the present, or the adoption of some measure looking to an increase of capital, in which latter event the directors will hereafter make some recommendation for the consideration of the shareholders. Every effort is being made to improve the efficiency of the various departments of your company's business, and to maintain its high reputation throughout the world."

The Union Steel Casting Company.—Some changes among the officials of the Union Steel Casting Company, at Pittsburgh, have recently been made. Harry E. Wainwright, Jr., and Uriak Tinkers have sold their stock and withdrawn from the company, and Samuel H. Church, secretary of the Pennsylvania Lines west of Pittsburgh, and George W. Eisenbeis, who have been stockholders since the company were organized three years ago, have bought their interests. Both have been elected directors. C. C. Smith is president; G. W. Smith, secretary, and George W. Eisenbeis, treasurer. The Union Steel Casting Company are manufacturers of steel castings from the smallest size up to 15 tons in weight. They have a complete plant and have a large amount of work on hand.

The Youngstown Foundry & Machine Company.—The Youngstown Foundry & Machine Company have received orders for the new 7 and 8 inch mills for the Brown-Bonnell Works of the Republic Iron & Steel Company at Youngstown, also for the tables for both of 7 and 8 inch mills. This firm are completing a contract for the transfer tables for the new billet mills at the Bessemer Works of the Republic Iron & Steel Company. They have been under construction for five months. One of the new 15-ton electric cranes ordered some time ago by the Youngstown Foundry & Machine Company has been put into service and the second one is expected to be installed about April 15. The firm have a very large amount of work on hand and are running their foundry and machine shops to full capacity.

The Rhodes Mining Company.—The Rhodes Mining Company of Pittsburgh have been incorporated under the laws of Delaware and in their name the interests of the Cherry Valley Iron Company in ore properties in the Mesaba district will be carried. A good portion of the property is undeveloped, except that test holes have been put down and complete reports and blue prints submitted, although a portion of the tract has been opened up, and it is the intention of the Rhodes Mining Company to bring down a considerable quantity of ore during the present year, which will be used in the two blast furnaces of the Cherry Valley Iron Company at Leetonia, Ohio, and Sharpsville, Pa.

Another Blast Furnace and Steel Plant Contemplated.—The United States Wire & Nail Company of Pittsburgh, operating rod, wire and wire nail mills at Shousetown, Pa., have under consideration the matter of erecting a blast furnace and basic open hearth steel plant to make their own steel. A meeting of the officials of the company will be held in a short time, when it is expected the matter will be definitely decided. In case the blast furnace and steel plant will be erected a large increase in the capital stock of the concern will be made.

The Youngstown Mfg. Company of Youngstown, Ohio, makers of bolts, nuts and rivets, have started up their plant, and while not running it full, expect to do so in a short time. This concern are considering the question of building a rolling mill to supply their own material, and a definite decision as to the building of this mill will likely be reached this week.

The Iron and Metal Trades.

Stray consumers of Foundry Iron are feeling the scarcity of metal quite keenly, and are forced to pay several dollars per ton premium for what they must have immediately. But of the whole tonnage which goes into the cupola, the converter and the open hearth furnace this is an almost infinitesimal percentage, the great mass of Iron which is being melted being delivered on old contracts at fair rates. The same is true of Steel. In times like these perspective is distorted, and much is made of what are comparatively trivial circumstances. It would, of course, be rash to deny their significance, which is that our home consumption is enormous, and that it slightly outbalances production. The balance would quickly swing in the other direction, however, if consumers got it into their heads that prices are abnormally high. While they are remunerative they are not unreasonable, nor is it likely that the shortage now so keenly felt will last more than 60 or 90 days.

The markets for Foundry Iron have been fairly quiet during the week, the only movement of consequence having taken place in Chicago, where Malleable Iron founders have purchased about 75,000 tons of Pig Iron for delivery during the second half. Our correspondent telegraphs that "these contracts have been placed in a number of instances against the advice of the furnacemen, who have assured their customers that they need have no anxiety about the supply of Malleable Bessemer after July. The advice has been taken to the extent of leaving a considerable part of the Malleable requirements uncovered, so that more business is assured from this source."

On the other hand, it has come to the surface that one large melting interest, while professedly eager for more Iron, has already purchased considerably more than is necessary to cover contracts for goods sold.

In some instances requests to delay deliveries have been received, but in every case this has been the result of the discovery on the part of the foundryman that the furnace company will not grant unreasonable time for payment, but that 30 days from date of shipment means that and nothing else.

So far as foreign material is concerned we hear of purchases of only small lots of Scotch Pig Iron, Steel Billets, Wire Rods, Shapes and Sheets. The markets abroad have run away, and the foreign Steel works profess to be unable to deliver promptly. They will probably discover later on that they can squeeze out a little more tonnage. For the present buyers of Steel in this country for the second half of the year are holding off to await developments at home.

Except possibly in Structural Material, where large contracts have been again placed, the new tonnage coming into the market is only fair in volume. We are going through a breathing spell, very welcome to the mills in their congested condition.

Prices are strengthening in nearly all branches, and for small lots and prompt delivery considerable premiums are being paid. Merchant Pipe quotations have been raised during the week.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type Declines in Italics.

	Mar. 19, 1902.	Mar. 12, 1902.	Feb. 19, 1902.	Mar. 20, 1901.
PIG IRON:				
Foundry Pig No. 2, Standard Philadelphia	\$18.50	18.50	17.25	15.25
Foundry Pig No. 2, Southern Cincinnati	15.00	15.00	14.75	14.00
Foundry Pig No. 2, Local Chicago	18.00	18.00	17.00	15.50
Bessemer Pig, Pittsburgh	17.50	17.25	17.00	16.75
Gray Forge, Pittsburgh	18.00	17.00	16.50	14.50
Lake Superior Charcoal, Chicago	20.50	20.50	20.50	17.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	32.00	31.00	30.00	24.00
Steel Billets, Philadelphia	32.00	32.50	32.00	23.25
Steel Billets, Chicago				25.00
Wire Rods, Pittsburgh	36.00	36.00	35.00	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	26.00
Spikes, Tidewater	2.00	2.00	2.00	1.55
Splice Bars, Tidewater	1.60	1.60	1.60	1.35
OLD MATERIAL:				
O. Steel Rails, Chicago	17.00	17.00	15.00	14.00
O. Steel Rails, Philadelphia			18.75	16.00
O. Iron Rails, Chicago	24.00	24.00	22.50	18.50
O. Iron Rails, Philadelphia	24.00	22.00	21.50	18.00
O. Car Wheels, Chicago	18.00	18.00	18.00	16.50
O. Car Wheels, Philadelphia	17.50	17.50	17.00	16.50
Heavy Steel Scrap, Chicago	16.50	16.50	14.00	13.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.82	1.82	1.67	1.40
Common Iron Bars, Chicago	1.85		1.75	1.55
Common Iron Bars, Pittsburgh		1.70	1.60	1.40
Steel Bars, Tidewater	1.75	1.75	1.62	1.50
Steel Bars, Pittsburgh	1.60	1.60	1.50	1.40
Tank Plates, Tidewater	1.78	1.78	1.78	1.65
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.50
Beams, Tidewater	1.85	1.85	1.75	1.63
Beams, Pittsburgh	1.70	1.70	1.60	1.50
Angles, Tidewater	1.75	1.75	1.75	1.53
Angles, Pittsburgh	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh	1.95	1.85	1.75	1.70
Skelp, Sheared Iron, Pittsburgh	2.00	1.90	1.80	1.75
Sheets, No. 27, Pittsburgh	3.00	3.00	3.00	3.10
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	2.90
Wire Nails, f.o.b. Pittsburgh	2.05	2.05	2.05	2.30
Cut Nails, Mill	1.95	1.95	1.95	2.00
METALS:				
Copper, New York	12.12	12.25	12.25	17.00
Spelter, St. Louis	4.10	4.10	3.95	3.70
Lead, New York	4.10	4.10	4.10	4.37½
Lead, St. Louis	4.02½	4.05	4.00	4.22½
Tin, New York	26.62	26.50	24.87½	25.40
Antimony, Hallett, New York	8.00	8.00	8.00	8.75
Nickel, New York	50.00	50.00	50.00	55.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	4.19	4.19	4.19	4.19

Chicago.

FISHER BUILDING, March 19, 1902. (By Telegraph.)

The strength of the market is convincingly shown by the manner in which specifications are being entered for forward delivery. One of the largest manufacturers of Structural Shapes and Merchant Steel reports the full capacity of the works covered for four to six months by specifications now in hand. The orders received are of course far in excess of this. Other manufacturers confirm the increasing disposition of consumers to specify for future delivery in their anxiety to be certain of receiving the material they are satisfied they will need. Such conditions as these seem to make the position of the trade positively assured through the summer months at least.

Pig Iron.—The feature of the week has been the placing of contracts by Malleable foundrymen. It is believed that contracts for considerably over 75,000 tons have been closed in the past ten days for Malleable Bessemer, all for delivery the last half of the year. These contracts have been placed in a number of instances against the advice of the furnacemen, who have assured their customers that they need have no anxiety about the supply of Malleable Bessemer after July. The advice has been taken to the extent of leaving a considerable part of the Malleable requirements uncovered, so that more business is assured from this source. The demand

for ordinary Foundry grades has been sharp for spot Iron and for very early shipment, but business for future delivery has not been large, although good inquiries are in the market. The supply of local Iron is extremely scanty and the large Southern companies are not willing to take more contracts at present. Prices for spot Iron run from \$1 to \$2 per ton above quotations made on contracts for the last half of the year. We quote as follows:

Lake Superior Charcoal.....	\$20.50 to \$21.50
Local Coke Foundry, No. 1.....	18.50 to 19.00
Local Coke Foundry, No. 2.....	18.00 to 18.50
Local Coke Foundry, No. 3.....	17.50 to 18.00
Local Scotch, No. 1.....	19.00 to 19.50
Ohio Strong Softeners, No. 1.....	19.60 to 20.00
Southern Silvery, according to Silicon.....	16.90 to 17.15
Southern Coke, No. 1.....	16.40 to 16.65
Southern Coke, No. 2.....	15.65 to 15.90
Southern Coke, No. 3.....	15.15 to 15.40
Southern Coke, No. 1 Soft.....	16.40 to 16.65
Southern Coke, No. 2 Soft.....	15.65 to 15.90
Foundry Forge.....	14.65 to 15.15
Southern Gray Forge.....	14.65 to 15.15
Southern Mottled.....	14.15 to 14.65
Southern Charcoal Softeners, according to Silicon.....	17.40 to 17.90
Tennessee Silicon Pig.....	18.65 to 19.15
Alabama and Georgia Car Wheel.....	22.65 to 23.15
Malleable Bessemer.....	18.50 to 19.50
Standard Bessemer.....	18.50 to 20.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	19.00 to 19.50

Bars.—Implement manufacturers have been heavy purchasers of Soft Steel Bars. These contracts are not so inviting to Bar manufacturers as in previous years, and some of the mills which have heretofore figured very prominently in handling this business are declining to book implement orders for the coming season, as they are convinced that sufficient current business will be secured at more profitable prices. The demand for Bar Iron from the general trade is good, but without special feature. Mill shipments of Common Iron are quoted at 1.85c. to 1.90c.; Soft Steel Bars, 1.75c. to 1.90c., and Hoops, 2.10c. to 2.20c. base, Chicago. Small Angles range from 2.25c. to 2.40c., Chicago. Jobbers are enjoying a continued very heavy demand. Small lots are quoted at 2c. to 2.10c. for Bars, and 2.45c. to 2.50c., base, for Hoops.

Structural Material.—So many of the mills are now out of the market that it is difficult for a buyer to place orders for mill shipment unless he is willing to wait for delivery until late this year or the opening months of next year. Nevertheless considerable business is being done, mainly through jobbers, who are securing prices much above those named by mills. An order for 400 tons was thus placed during the week for material which will be shipped within 30 days. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. Small lots of Beams and Channels from local yards are quoted at 2.50c. to 3.50c.; Angles, 2.50c. to 3.50c. rates; Tees, 2.55c. to 3.50c. rates.

Plates.—Orders for mill shipments are running up to a good tonnage, and are coming from a wide range of consumers. Jobbers are doing a large business and their trade is extending over a greater area, as the mills are found to be deferring deliveries to a still later day. The demand for prompt shipment enables orders of this character to be secured at an advance of \$1 to \$2 per ton over mill prices. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c. to 1.95c.; Marine, 1.95c. to 2.05c. Jobbers are selling small lots from store at 2c. to 2.10c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—A large volume of business is reported in Galvanized Sheets, but the demand for Black Sheets is not specially heavy, although even on the latter the mills are not in any case promising earlier than three weeks' delivery. Continued scarcity is noted in 10 to 14 gauge. Mill shipments of No. 27 Black Sheets are quoted at 3.10c. to 3.20 c., and Galvanized at 70, 10 and 5. Jobbers quote small lots at 3.35c. to 3.45c. for No. 27 Black, and 70 and 5 for Galvanized.

Merchant Pipe.—Manufacturers made another advance March 15, and report an exceedingly good demand, which promises to increase. Carload lots are quoted as follows, random lengths: Black, ⅜ to ½ inch, 56½ off;

¾ to 12 inches, 63½ off; Galvanized, ⅜ to ½ inch, 43½ off; ¾ to 12 inches, 50½ off.

Boiler Tubes.—While prices are very firm no advance has been made. The demand is excellent. Quotations are as follows:

	Steel.	Iron.
2½ to 5 inches.....	57½	47½
1½ to 2½ inches.....	50	40
1 to 1½ inches.....	35	30
6 inches and larger.....	52½	45

Merchant Steel.—The implement manufacturers are the largest buyers in this line. Good contracts have been placed for specialties and heavy inquiries are being received, promising continued good trade. Mill shipments are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.45c. to 2.55c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 50 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted 6½c. to 7c. for mill shipments; specials, 12c. upward.

Rails and Track Supplies.—Nothing of importance has transpired, owing to the sold up condition of the mills. Heavy Sections are quoted at \$28 and Light Sections at \$32 to \$37. Fastenings are quoted as follows, in carload lots: Splice Bars, 1.75c. to 1.80c.; Spikes, 2.20c.; Track Bolts, with Hexagon Nuts, 3.10c.; Square Nuts, 2.95c.

Old Material.—Prices are now so high that dealers are inclined to the opinion that the top of the market has possibly been reached. Nevertheless buyers are found for all kinds of Old Material, and the prices quoted are easily secured, while in some cases even higher rates are stated to have been obtained. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$24.00 to \$25.00
Old Steel Rails, mixed lengths.....	17.00 to 17.50
Old Steel Rails, long lengths.....	24.50 to 25.00
Heavy Relaying Rails.....	29.00 to 30.00
Old Car Wheels.....	18.00 to 18.50
Heavy Melting Steel Scrap.....	16.50 to 17.00
Mixed Steel.....	13.50 to 14.00

The following quotations are per net ton:

Iron Fish Plates.....	\$21.00 to \$21.50
Iron Car Axles.....	24.00 to 24.50
Steel Car Axles.....	21.50 to 22.00
No. 1 Railroad Wrought.....	19.00 to 19.50
No. 2 Railroad Wrought.....	17.25 to 17.75
Shafting.....	18.50 to 19.00
No. 1 Dealers' Forge.....	15.00 to 15.50
No. 1 Busheling and Wrought Pipe.....	13.50 to 14.00
Iron Axle Turnings.....	13.00 to 13.50
Soft Steel Axle Turnings.....	12.50 to 13.00
Machine Shop Turnings.....	12.50 to 13.00
Cast Borings.....	8.00 to 8.50
Mixed Borings, &c.....	8.00 to 8.50
No. 1 Rollers, cut.....	13.00 to 13.50
Heavy Cast Scrap.....	14.50 to 15.00
Stove Plate and Light Cast Scrap.....	11.00 to 11.50
Railroad Malleable.....	15.00 to 15.50
Agricultural Malleable.....	13.00 to 13.50

Metals.—Copper is in fair demand at 13c. for carload lots of Lake and 12¾c. for Casting brands. Consumers are free purchasers of Pig Lead at 4.05c. for Desilverized and 4.15c. for Corroding in 5-ton lots. Selling prices of small lots of Old Metals are as follows: Heavy Cut Copper, 11½c. to 12c.; Red Brass, 11½c. to 12c.; Copper Bottoms, 10½c. to 11c.; Pipe Lead, 3.90c.; Zinc, 3.25c.

Coke.—The supply of Coke is still inadequate. The local furnaces are not able to increase their stocks of fuel and foundrymen are continually short and in search of dealers who have any Coke coming in. Spot Coke commands \$5.50 to \$5.75. Contracts are unchanged at \$5.25 for Standard Connellsville 72-hour Foundry Coke.

Philadelphia.

FOREST BUILDING, March 18, 1902.

The difficulty in reporting the market correctly appears to increase week by week. In a general way conditions are not materially different to what they have been ever since the first of the year, except that the scarcity is more noticeable and is now extending beyond Pig Iron and the Steel Billet lines. The furnace report of last week gave no encouragement for better things in the near future, but was ample confirmation of what most people were expecting, although the decrease in production was greater than had been generally figured on. The outcome of the week may therefore be summarized by saying that the shortage of Pig Iron is more

widespread than ever, and that Old Material, which until recently has been in fairly good supply, is now almost unobtainable. Finished Material is stiffening because of the higher cost of raw materials, while the demand along the entire line, from Pig Iron to the most advanced products appears to be steadily expanding. The immediate result, therefore, has been to impart additional strength to prices, which although not officially higher are in actual transactions considerably higher for prompt deliveries, which is mainly what buyers are after. Some makers are willing to accept orders at regular quotations providing that deliveries can be pushed several months ahead, but the majority say they have all the business they want, and decline anything further unless it happens to be something particularly attractive. On the whole, therefore, it is safe to assert that business was never more prosperous than it is to-day, the great difficulty is to find means for handling it promptly and satisfactorily.

Pig Iron.—What is the price of Pig Iron? A question of that kind can usually be answered with a fair degree of confidence with 50c. per ton as a margin to come and go on; but it cannot be done in times like these. Leading houses, those who know as much as any can know, only yesterday named as much as \$4 per ton difference in prices for the same grades of Iron. Of course explanations as to the why and the wherefore, brings them within about \$2 of an agreement, but even that shows a pretty wide difference of opinion. No wonder that buyers are confused and in some cases are hard to convince that they are being treated fairly, but how can matters be mended? If there is no spot Iron to be had at less than say \$19 to \$20 for No. 2 X Foundry, there is no alternative but to pay the price or go without the Iron, and, as a matter of fact, that is precisely the situation at the present time. Orders for the same grade of Iron can also be placed at \$16.50 to \$17, but no deliveries are promised inside of six months, and not guaranteed even then, so that it is just a question whether it is better to pay \$20 for something that can be had at once, and so tide over an emergency, or to contract for something \$3 or \$4 less for deliveries at a time when conditions may be entirely different to what they are at the present time. These are the problems which the trade are trying to solve. The Southern furnaces appear to have decided to continue selling the greater portion of their anticipated product at present prices just as far ahead as their customers are willing to take it. They say that they will fill their orders on the principle of first come first served, but guarantee nothing beyond that. This is a new experience, and one that will take time to establish, but the idea appears to be all right—viz.: to check speculation by giving buyers all the Iron they want when prices are on a remunerative basis, as they are now. The other side of the story is, that as the companies are working on a sliding scale, they would have to advance prices \$1.50 per ton to secure 50c. for themselves. In other words, 50c. more profit to the makers would mean \$1.50 higher cost to the consumer. So far as immediate relief to the market is concerned, prospects are no better than they were a week ago. Prices are therefore almost unquotable. Higher prices are mentioned for March and April shipments, but the extreme range would be about as follows for city and nearby deliveries:

	Deliveries	
	Deliveries to July.	July to December.
No. 1 X Foundry.....	\$19.25 to \$20.00	\$18.50 to \$19.00
No. 2 X Foundry.....	18.75 to 19.50	17.00 to 17.50
No. 2 Plain.....	18.25 to 18.50	16.50 to 17.00
Standard Gray Forge.....	17.50 to 18.00	16.75 to 17.25
Ordinary Gray Forge.....	16.75 to 17.00	16.50 to 17.00
Basic (Chilled).....	18.00 to 18.50	18.00 to 18.25
Bessemer	19.75 to 20.00	19.00 to 19.50

Billets.—If Steel is wanted—and it is wanted badly—there is no alternative but to hunt around for it, and make the best terms possible when sellers are found. At a venture \$32 to \$33 for Bessemer, and two to three dollars more for Open Hearth Steel would be a fair guess, but no sales have been reported, and no Steel offered very recently. A considerable tonnage of German Steel is arriving with more to follow. New contracts for Sheet Bars could be made at about \$34 c.l.f., but no recent sales for this district have been reported.

Muck Bars.—The scarcity of Steel has diverted business to the iron mills, consequently Muck Bars are in active demand, asking prices being \$33 to \$33.50 delivered at buyers' mills.

Plates.—The demand is very heavy and mills are beginning to turn down a good deal of business. They are already full for two or three months to come, and with prospects of a long period of activity, there is a disposition to be more conservative in booking orders at current quotations. Most of the mills are getting one to two dollars per ton advance on ordinary quoted rates, but with the increasing cost of raw materials it is not unlikely that an all round advance will be made at an early date. Meanwhile nominal quotations are as follows for Philadelphia and nearby deliveries: Universals, 1.80c. to 1.85c.; Sheared, 1.80c. to 1.90c.; Flange, 1.90c. to 2c.; Fire Box, 2c. to 2.10c.; Marine, 2.05c. to 2.10c.

Structural Material.—Nothing but a repetition of recent reports can be made under this heading. Deliveries are far in arrears, and prospects for catching up are no better than they have been for months past. Nominal quotations are as follows, but for reasonably early deliveries there is practically nothing to be had unless at five to ten dollars premium. Prices are as follows: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—There is plenty of business, and prices are gradually working to a higher level. No official change in quotations has been made, but most of the mills are getting five to ten cents per hundred pounds more than the nominal rates, which for Iron Bars are 1.82c. to 1.90c. and Steel Bars 1.75c. to 1.85c.

Sheets.—There is no scarcity of orders, but it is said that specifications are a little slow, but the mills are glad to have an opportunity to get a little ahead, as it is considered certain that the demand will be very heavy during the spring and summer months. The range of prices for carload lots and upward of ordinary Sheets would be about as follows (and a tenth to two-tenths more for best qualities) viz: No. 10, 2.30c. to 2.40c.; No. 14, 2.60c.; Nos. 16 and 17, 3c.; Nos. 18-21, 3.10c.; Nos. 26, 27, 3.30c. to 3.40c.; No. 28, 3.50c.

Old Material.—Prices have made a big advance during the past few days, but the market is so irregular that it is almost impossible to give exact quotations. Sales, however, have been made as follows: Heavy Melting Steel, \$22; Iron Rails, \$26; No. 1 Railroad Scrap, \$23.50; Busheling Scrap, \$20.50; Iron Axles, \$26; Low Phosphorus Scrap, \$25.50. Bids and offers are about as follows for deliveries in buyers' yards: Low Phosphorus Scrap, \$25 to \$26; Choice Railroad Scrap, \$23 to \$23.50; Light, Ordinary, \$14 to \$15; Light, Forge, \$16 to \$17.50; Machinery Cast, \$16.50 to \$17.50; Heavy Melting Steel, \$21 to \$22; Iron Rails, old, \$24 to \$26; Wrought Turnings, \$15 to \$16; Choice Heavy, \$16 to \$16.50; Cast Borings, \$9 to \$10; Old Car Wheels, \$17.50 to \$18; Iron Axles, \$26 to \$27; Steel, \$22 to \$23.

St. Louis.

CHEMICAL BUILDING, March 19, 1902.—(By Telegraph.)

Pig Iron.—The inquiry and sales have slackened in volume considerably, but the tone of the market is very firm and the amount of material available for immediate shipment is very light. Owing to this light order of stocks on hand a wider range of prices prevails and advances of 50c. and sometimes more for small lots above our quoted prices are not uncommon. A fair business is said to have been done in Malleable Bessemer and the quotation for St. Louis delivery is said to be \$19.50 to \$20. Owing to the improvement in weather conditions shipments are moving in a more satisfactory way and work of production is also showing improvement. We quote for cash, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry.....	\$16.00 to \$16.50
Southern, No. 2 Foundry.....	15.25 to 15.75
Southern, No. 3 Foundry.....	14.75 to 15.25
Southern, No. 4 Foundry.....	14.25 to 14.75
No. 1 Soft.....	15.75 to 16.25
No. 2 Soft.....	15.25 to 15.75
Gray Forge.....	14.25 to 14.75

Bars.—A very heavy demand continues. We are told that the mills are compelled to turn down many requirements on account of their inability to make delivery on specified time. No further charges are to be noted in the price-list. Conditions among the jobbers are still of an active and strong character and no complaints are to be heard. We quote from mills: Iron Bars at 1.90c., Steel Bars at 1.90c. to 2c. Jobbers quote Iron Bars at 2c., and Steel Bars at 2.10c., full extras.

Rails and Track Supplies.—The market for Rails and Track Supplies is ruled by a heavy demand and conditions are said to be very satisfactory to the manufacturers. Prices are on a very firm basis. We quote: Splice Bars, 1.75c. to 1.95c.; Bolts, Square Nuts, 2.75c. to 2.90c.; with Hexagon Nuts, 2.90c. to 2.95c.; Spikes, 2c. to 2½c.

Sheets.—A trade of large volume is being taken care of in the market for Sheets of all grades, and in the matter of prices a general firmness is to be noted. Jobbers quote Stove Pipe size, No. 27, at 3.60c. to 3.65c., and Galvanized Sheets, 70 to 75 and 5 off in round lots.

Angles and Channels.—The demand for Small Angles and Channels is said by the jobbers to be of large and satisfactory volume. In the matter of prices no change is to be noted. For materials of this class 2.30c., base, is the quotation.

Pig Lead.—Generally quiet, but a firm order of conditions rules in the market for Pig Lead and prices are without much variation. The quotation for Chemical is 4.02½c., and Desilverized 4.05c.

Spelter.—The market for Spelter is firm and quiet, and while the volume of business has not been large, it is said that the offerings are light and 4.10c. is bid.

Cleveland.

CLEVELAND, OHIO, March 18, 1902.

Iron Ore.—The Ore situation on the lakes is becoming somewhat complex. The shippers are still refusing to pay the 80c. between Duluth and Ohio which has been demanded by the transportation companies, and the reason for this is variously assigned. The statement which the shippers themselves make is that the amount of tonnage applicable to the movement of the season's Ore is so much in excess of the supply that no better rate would be warranted. In other circles, however, the statement is made, based upon what seems to be good authority, that those who are naming the rates here are merely agents of New York capitalists who are in control of the mining companies. The latter class has decided that no better rate than 75c. shall be paid, consequently those who have to make the distribution of the Ore among the transportation companies are limited in the scope of their action. The belief that such conditions prevail has given a very decided tone to the demands of the vessel owners. They have announced very positively that they will carry no Ore for 75c. a ton and stand ready to tie up their boats until the middle of April or May 1, or even until June 1, if necessary to enforce their demands. They have likewise provided a rising scale of rates, which will be insisted upon the longer the boats are kept out of commission. This struggle is one of the interesting possibilities of the spring, since the season of navigation bids fair to open April 1 or thereabouts. Some Ore sales are still being made on the old list of prices, \$4.25 for Bessemer and \$3.25 for non-Bessemer old range and Bessemer Mesaba, and \$2.75 for non-Bessemer Mesaba.

Pig Iron.—While the feverish buying of Pig Iron has for the present subsided, there is every evidence that the need for it has abated none whatever. The intense activity in the Steel trade gives ample evidence along that line. The buyers, however, have become convinced of the futility of trying to buy material now and desire to wait until future conditions develop. Instead of buying too far ahead. As it is, some of the consumers have gone upon the market and have partially covered their needs well into the first quarter of next year. There still remains, however, some un-

sold capacity in December of this year with most furnaces, while some other furnaces announce that they are not so well sold up on Foundry grades. Very few are now making any quotations whatever, all prices being purely nominal. The sales that might be made now, for quick shipment especially, would be upon a basis which would hardly represent the market, as buyers are offering large premiums over the regular prices. On Foundry grades a nominal quotation of \$17.50 for No. 1 and \$17 for No. 2, Valley furnace, prevails. It is expected that presently there will be some sales of Bessemer Pig for the fourth quarter delivery, but at present nothing of the sort has been done. The market is quiet, with most of the furnacemen not offering any material or making any quotations, which is accounted for by the fact that all of the available material up to the end of the third quarter has been disposed of. Basic producers are in the same predicament, and while there is a sharp call for Iron, they have none to sell. All Pig Iron men are quoting \$16, Valley furnace, for both Bessemer and Basic Irons. The Coke situation is not relieved and, in fact, has been aggravated by the removal from this territory of some engines and cars which had been sent down from the Northwest to help out and are being sent back there to handle Ore.

Finished Material.—The demand for Structural Steel continues to be all out of proportion to the supply of it. The mills are practically out of business for this year's trade in building material, although some later contracts may be placed for bridge work. No definite time is now stated in which the mills would be able to make any deliveries, as nothing could be offered inside of eight or nine months, and promises so far ahead are uncertain. The present activity is out of stock. The dealers here have been hoping to collect some stores, but have been unable to do so on account of the extraordinary demand. Almost everything is sold either in transit or immediately upon delivery to the stores and the movement therefore is almost direct from the mill. At a meeting of the association governing Structural Shapes it was decided that, notwithstanding the situation at present, there will be no change in the prices just now. Some had insisted upon an advance, and it is understood that one or two of the Eastern mills have made one, but not to affect this market. Store prices hold at 2¼c. to 3c. The Bar market likewise is strong. It has been decided to bring all prices on the same level April 1. Up to this time certain big orders have been covered at less than the price agreed upon at the recent meeting, but after April 1 there will be no deviation from the new scale. The prices therefore will hold at 1.60c., Pittsburgh, for Bessemer Steel Bars, and 1.70c., Pittsburgh, for Open Hearth Steel Bars and Iron Bars. The material is sold up away ahead of production. Plates have been selling well of late, but hardly up with the remainder of the market, especially as pertains to Sheared Plate. Universal mill products are very hard to obtain now. A meeting of the association recently decided to continue through the summer the present quotation of 1.70c. The Sheet trade is starting up for the spring season and the buying this week has been quite heavy. The demand is as brisk as the dealers have prepared for. Most of the sales here are out of store, upon which the quotations continue to be 3.45c. to 3.60c. for No. 27 as a base, One Pass Cold Rolled; full Cold Rolled are quoted at 10c. extra. The Pittsburgh basing discounts on Pipe have been advanced about 5 per cent. during the week. Those on Black Pipe are now 60 and 67 off list, and on Galvanized Pipe are 48 and 55 off list. The demand for Sheet Bars and Billets has not lessened in the least. The recent open announcement of some of the independent mills that they propose to import their Steel was supposed to be a bid for some Sheet Bars and Billets from the companies who are producing the material. If it was desired to bring out some Steel by this announcement, the end aimed at was not accomplished, for not a ton has been offered. Some of the new mills, which have been started without means for producing their own Steel, will therefore be compelled to depend upon the foreign supply or go

without. This touches a number of mills in the Valleys, besides concerns in Cleveland.

Old Iron.—The Scrap trade has not changed much in a week. Those who have material are hoarding it and the dealers are being asked constantly increasing prices. The speculators are operating quite freely and the market in that respect is strong. Consumers, however, refuse to pay advanced prices. The quotations continue to be: No. 1 Wrought, \$18 net; Cast borings, \$8 gross; Wrought Turnings, \$13.75 gross; Cast Scrap, \$14 net; Old Iron Rails, \$22 gross; Old Iron Axles, \$22 net; Steel Rails, \$17 gross; Old Car Wheels, \$17 gross.

The French Iron Market.

PARIS, March 1, 1902.—Although it has not undergone the degree of discouragement from which the metallurgical industry of Germany has suffered so long, France, like its northern neighbor, Belgium, has had some very bad days. There has been very little business and a sharp competition between the metallurgical groups has been in evidence. This struggle has been so intense that the manufacturers, in order to keep their mills going, sold below cost of production without any regard to consequences. For some time, however, the horizon has been clearing, so that without making any optimistic predictions as to future recovery, we may state at least that a noticeable improvement has taken place. As a matter of fact, no complaints are now made by Iron masters, and it seems as though every one is agreed that business is improving, since an increase in price is being constantly talked of. Manufacturers meet, discuss and confirm old prices. This means a good deal, particularly in France.

The manufacturers of Pig Iron in Lorraine have obtained some advantage from the rising of prices in Belgium, and export prices have gradually risen 5 francs. The following is the status of the blast furnaces in the Lorraine district: In the Longwy section there are blowing 22 out of 36 furnaces, five of them on Mill Iron, making an average of 460 tons per day; ten on Foundry Iron, producing 810 tons per day, and seven on Basic Pig, yielding 700 tons per day. In the Nancy section 21 out of 34 furnaces are in operation, three of these are running on Mill Iron, making 305 tons per day; seven are operating on Foundry Iron, with a daily production of 490 tons, and 11 are producing Basic Pig, with a daily output of 1230 tons. This makes for the entire Lorraine district 43 furnaces out of 70 in blast, of which eight are producing 765 tons of Mill Iron per day; 17 are making 1300 tons of Foundry Iron per day and 18 are producing 1930 tons of Basic Pig per day.

What has shielded France against the severity of the prices of 1901 is the protective tariff, which has safeguarded the home market against foreign importation. As a matter of fact, these have fallen off 151,000 tons, or nearly 40 per cent., compared with 1900, as the following table shows:

Imports into France.—Metric Tons.			
	1901.		1900.
Pig Iron.....	137,193		231,120
Finished Iron.....	44,829		74,827
Steel.....	10,920		26,815
Old Material.....	11,448		56,613
Totals.....	234,390		385,375

Besides this the maintenance of higher prices in France has permitted the works to more easily bear the sacrifices imposed upon them by their efforts to hold their export outlets. As a matter of fact, each plant reaches a certain compensating average cost price. The higher prices are in the interior the more sacrifices may be made for export. Below are the figures for the exports in 1900-1901:

Exports from France.—Metric Tons.			
	1901.		1900.
Pig Iron.....	97,321		114,372
Finished Iron.....	41,783		33,817
Steel.....	56,703		21,043
Old Material.....	29,645		27,946
Totals.....	225,452		197,178

The following is a review of the markets in the different parts of the country:

In the North and in the Pas de Calais district or-

ders are more plentiful generally, and particularly for smaller sizes of bars, for which orders have been placed for a considerable period in advance. Merchant Bars are selling at 5 francs, but it is probable that the rolling mills at the meeting which they are to hold at Aul Noye on the 8th inst. will decide to raise the price.

The rolling mills of the Ardennes district have well filled order books, both so far as Bars are concerned and so far as Bolts, Nuts and other similar articles are taken into account. Plates are obtaining some advantage from this firmness, and are held at 19.50 to 19.75 francs.

In the Loire district the big Steel works are running fairly well. They would like more orders from the navy and from the Ordnance Department, and so far as the future is concerned there is even some disquietude. In the Meurthe et Moselle district Iron Bars are quoted at 15.50 francs. Numerous transactions are passing at this price, both with consumers direct and with merchants, the latter finding it necessary to stock up. The weather being favorable to building the Beam and Shape trade is moving more easily. In the Haute Marne the rolling mills have work assured them for a good time to come. They have carried the base price of Bar Iron up to 16 francs, and will not accept anything under this figure. There is even a question of a still further raise to 16.50.

In Paris the prices for consumers are 15.50 for Iron Bars and 16.50 for Beams. The quotations made by the metallurgical syndicate are 17 francs for Merchant Bars, first class; 18 francs for Beams, and 21 francs for No. 2 Plates, base. New Steel Rails are quoted at 16 francs for Heavy Sections; 16.50 for 20 kilos per running meter, and 20 francs for Light Rails. Old Steel Rails are sold at 9 francs.

On the whole, therefore, the market has become more satisfactory. It has felt the reaction toward improvement which has occurred in other countries, and more particularly in the United States, in Germany and in Belgium. As a matter of fact, what improvement has taken place in France is the effect rather of the happenings in other markets. The orders emanating in the home market are still insufficient, and our Ironmasters bitterly compare what is going on in France in this regard with what is happening in foreign countries, and particularly in Germany.

Cincinnati.

FIFTH AND MAIN STS., March 19, 1902.—(By Telegraph.)

The Pig Iron market is still quiet, but by no means dull. One of the main reasons why Iron is not selling more freely is because furnaces are either already sold out or prefer to withhold their output for late delivery until they see where they land in regard to prices and stock to offer later in the year. The price of the leading Southern interests is nominally unchanged, yet in the face of this it is a known fact that No. 2 Foundry is selling from outside furnaces as high as \$13, Birmingham basis, and for delivery prior to August premium of even 50c. over that figure is offered. There is a strong undertone to the quotation list, and it is very hard to see how the minimum price of \$12.50, Birmingham, for No. 2 can be much longer maintained even nominally, as a good portion of the actual selling is being done considerably above that figure. No. 4 Foundry and Mill grades are specially scarce, and the assertion is made that offers are out for round lots on the basis of \$12, Birmingham. There is a determined effort being made to raise selling prices, and in this sellers claim the support of buyers to a very large degree. The situation is certainly a novel one, and is full of interest. Freight rate from Hanging Rock district is \$1.10, and from Birmingham \$2.75. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$15.25 to \$16.25
Southern Coke, No. 2.....	14.75 to 15.75
Southern Coke, No. 3.....	14.25 to 15.25
Southern Coke, No. 4.....	13.75 to 14.75
Southern Coke, No. 1 Soft.....	15.25 to 16.25
Southern Coke, No. 2 Soft.....	14.75 to 15.75
Southern Coke, Gray Forge.....	13.75 to 14.75
Southern Coke, Mottled.....	13.75 to 14.75
Ohio Silvery, No. 1.....	18.25 to 18.50
Ohio Silvery, No. 2.....	17.75 to 18.00
Lake Superior Coke, No. 1.....	18.35 to 18.60
Lake Superior Coke, No. 2.....	17.85 to 18.10
Lake Superior Coke, No. 3.....	17.35 to 17.85
Southern Basic.....	to 16.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	\$20.25 to \$20.75
Standard Southern Car Wheel, No. 2	19.75 to 20.25
Lake Superior Car Wheel and Malleable	20.75 to 21.75

Plates and Bars.—The market is strong and active on unchanged basis. We quote, f.o. b. Cincinnati: Iron Bars, in carload lots, 1.82c., with half extras; same in small lots, 1.85c. to 1.90c., with full extras; Steel Bars, in carload lots, 1.72c. to 1.80c., with half extras; same in small lots, 1.85c. to 1.90c., with full extras; Angles, in carload lots, 2c to 2¼c.; Plates, ¼-inch and heavier, 2c.; 3-16 inch, 2.10c.; Sheets, No. 16, 1.85c. to 1.95c.

Old Material.—There has been a stiff advance in prices, and the market has been an active one. Dealers' buying prices, f.o.b. Cincinnati, are as follows, all quotations, except No. 1 Wrought, on the basis of gross tons: No. 1 Wrought Railroad Scrap, \$17.75 to \$18; Cast Railroad and Machine Scrap, \$13 to \$13.50; Iron Axles, \$22 to \$22.50; Iron Rails, \$21 to \$22; Steel Rails, rolling mill lengths, \$17 to \$18; Short Lengths, \$14.50 to \$15.50; Car Wheels, \$18.

Birmingham.

BIRMINGHAM, ALA., March 17, 1902.

Last week's letter stated that there were unmistakable evidences of a subsidence of the keen demand that had characterized the Iron market. The correctness of that statement is confirmed by the course of the market this week. So far as the volume of transactions is concerned, they have materially decreased. But prices have not been lowered the least bit. There continues to be but little Iron offering. In fact, the buyers are hunting the sellers, and appeals and inducements go hand in hand in the effort to coax out some Iron. Some buyers whose letters and telegrams failed to receive a favorable response have come in person to voice their needs and prepared to pay asking prices. But the successes scored have been few. A few sellers entertain the idea that Iron is worth all it will bring, and those fortunately situated as to delivery have secured the top of the market. But the aggregate of such sales is very moderate. For No. 1 Soft \$14 was obtained. For No. 2 Foundry \$13 was obtained. Gray Forge is reported all the way from \$12 to \$12.50. At these prices the sales were very limited, and in quantity confined to single and two and three car lots. At the same time there were buyers who would have taken some important lots at these prices just to end their anxiety and uncertainty. The leading interests still quote the market on the basis of \$12 for No. 2 Foundry, and when they sell they do so on that basis. As it happens their sales are at this time very limited. It is a difficult matter to place new business of any magnitude this side of the fourth quarter of 1902. Some interests are still out of the market and decline to price for any delivery, and have so instructed their sales agents. A very prominent official in the Iron world here said to your correspondent: "We know of the sales at outside prices and we know we could obtain the same figures. But the policy is unsound and all our efforts will be directed to the maintenance of conservative prices. We want to see market values on a fair business basis, and we believe that in time buyers' wants will be satisfied." It is just such conservative talk and action that will tend to quiet fears concerning supply. But the trouble is that those who talk this way and act this way are heavily sold for forward delivery, and can come to the relief of the market to only a very limited extent. "To this complexion hath it come at last." The situation as to cars has improved and they are more freely furnished, with good prospects for a further improvement in this respect. This will tend to ease up the situation, as there is considerable Iron piled up in some yards awaiting shipment. If it could obtain prompt shipment all our yards would soon be practically denuded. The shipments of Pig Iron from Alabama and Tennessee during February amounted to 138,163 tons. Of this amount 76,953 tons went from this district. The shipments of Cast Iron Pipe were 10,755 tons, and of this amount Birmingham shipped 5573 tons.

The exports were a bagatelle of 133 tons. In Pig Iron the February shipments were approximately 25,000 tons less than the January shipments. This was due in part to bad weather and a shortage in cars. The February shipments of Steel were the largest for any month yet reported, being 8835 tons. The Steel mill has now eight open hearth furnaces in commission. When the necessary cranes are in place and the necessary ladles are obtained, according to the plans mapped out, four of the hearths can be dispensed with without detriment to results. But the alteration determined upon takes time to inaugurate. The additional soaking pits and gas producers decided upon as necessary are almost completed. From primal sources the information comes that it will be some time before the Rail mill will roll Rails. The product of the Steel mill at present consists of 1½ to 1¾ and 4 x 4 Billets, ¼ x 8 Tin Plate Bars, Axle Billets, Blooms and Slabs. It can be said that very satisfactory results are now being obtained and everything is working smoothly.

Mention was made last week of an effort to organize a new rolling mill company, with a capital of \$100,000. The project has met with such favor that the projectors have determined to increase the capital if possible to \$500,000, and enlarge accordingly the contemplated plant. So far the promoters express great satisfaction at the encouragement received. Some Pennsylvania people spent several days here last week looking over the situation, with a view of establishing works for building street cars and automobiles. As they expressed only satisfaction at the prospects of a successful business here in that line, the deduction is that it will be secured. The dissensions among the stockholders of the Alabama Steel & Wire Company have been happily ended. In the adjustment of the differences the Robinson interests were taken over by the Messrs. Shulers, and "peace reigns once more in Warsaw." Questioned as to the meaning of their late purchase of mineral and Coal lands, the declaration was made that there was no significance in the purchases beyond a desire for protection against possible happenings, and that, barring their Coal possessions, they had no intention whatever at present of developing the property. But there are other properties being tested and other plans being matured that will in the end give us increased furnace capacity. It will not stop there, for two of the best developers and promoters the district ever had have put their shoulders to the wheel and have so far a very flattering prospect for a successful fruition of their plans. H. E. Buck & Co., representing the Trussville Furnace, will build a Coal washing plant and a battery of Coke ovens. The Alabama Consolidated Coal & Iron Company are taking the boilers, which were new, out of the Mary Pratt Furnace and shipping to such of their furnaces as are in need of additional boiler capacity. When quizzed if this meant the dismantling of the Mary Pratt the answer was, not necessarily. If it was contemplated to put that furnace in operation in the near future the boilers would not be taken out and shipped away. We can safely say that for the present the Mary Pratt Furnace is a dead duck. The Warrior River Light & Power Company will on April 1 consolidate with the Steel Cities Railway Company, and the company will be known as the Birmingham & Steel Cities Railway Company. Their combined capital is to be \$2,000,000. Bonds to that amount will be issued. The management claim that \$1,500,000 of these bonds will be taken up by a Cincinnati firm. The prospects for the building of the West Alabama Railroad are now bright. Surveying parties are in the field and it is claimed that the money to build it will be forthcoming from a Chicago trust company upon the completion of the survey. The contract for the building of the Tuscaloosa Furnace for the Central Coal & Iron Company was secured by the Birmingham Boiler Works. They are also building a creosote plant for New Orleans, 11 retorts for the Southern Oil & Chemical Company, a stove for the Dayton Furnace and an elevated Steel tank for Charleston, S. C. It looks as if the business offering is on a constant increase.

Pittsburgh.

(By Telegraph.)

HAMILTON BUILDING, March 19, 1902.

Pig Iron.—The present condition of the Pig Iron market is without parallel in the history of the Iron trade. While it is true that the furnaces have been more or less handicapped for some time past, by reason of Coke shortage, floods and other causes, yet with an output of nearly 1,500,000 tons a month stocks are steadily decreasing and some of the large steel companies find it impossible to get Iron as fast as they need it, and several Steel plants have been compelled recently to run short handed until Iron could be secured. There is really no official price on Bessemer Pig Iron, but a good deal of tonnage has been sold in the past week, some of it as low as \$16 at the furnace, while other Iron brought \$17.50 and higher. It is really not a question of price in the Pig Iron market any longer, but where to get the metal. It is probable there would be no trouble in selling Bessemer Iron to-day for delivery in the second and third quarters at \$17.50 to \$18 at the furnace. The Iron this side of October has been pretty well cleaned up, and for any stray lots that can be had sellers can get almost any price they ask. Forge Iron has again advanced, and has sold at \$18 to \$18.25, Pittsburgh. No. 2 Foundry Iron has sold up to \$20 a ton, Pittsburgh, for prompt delivery. The Pig Iron market is in that shape that it is practically impossible to quote prices.

Steel.—No large lots of Steel are changing hands, mainly for the reason that consumers find it almost impossible to buy. A sale of 1000 tons of 4-inch Billets has been made at about \$32, delivered in Youngstown district. Foreign Sheet Bars have sold at \$33 to \$33.50, delivered, and it is said that negotiations are on looking to the importation of several large lots of foreign Billets and Bars. Basic Open Hearth Billets for prompt shipment have sold at \$33 to \$35 a ton, maker's mill.

(By Mail.)

The situation in the Iron trade is about the same as noted in these reports for some weeks past. The great prosperity in the Iron trade is being reflected in industrial stocks, nearly all of which have shown sharp advances in the past week, Republic leading. The retirement of \$200,000,000 of 7 per cent. preferred stock of the United States Steel Corporation and the issuance in its place of \$250,000,000 worth of second-mortgage 5 per cent. bonds is attracting a good deal of attention. The corporation will effect a saving of \$1,500,000 in annual interest charges, and in addition will secure \$50,000,000 more working capital, which will be used in betterments of existing plants. It is hardly likely any of the money will be devoted to buying out competitive plants, as several high officials of the Steel Corporation have stated that the corporation have all the works they need and will not take over any more. It is probable the plan outlined above will be consummated at an early date. Nothing has been done in Pig Iron with the leading interest for delivery in last quarter and no negotiations are under way at the present time. It is understood that some Bessemer Iron has been sold for second and third quarter delivery at \$16.50 to \$17 and higher, at Valley furnace. Forge Iron has sold at \$17.50, Pittsburgh, for second half, and there have been sales of round lots of Foundry at high prices. Finished Material is in urgent demand, and deliveries for various causes are as hard to get as at any time for some months. This is particularly true of Structural Steel, the mills being simply gorged with tonnage and sold up for six to eight months. Merchant Pipe is in active demand and the market is firm.

Steel Rails.—The Ohio Works of the National Steel Company will go on Rails about April 1. It is said the mills have taken some contracts for Rails for delivery in 1903. We quote at \$28, at mill, for Standard Sections. Light Rails are very scarce and bring high prices. Sixteen-pound Rails have sold at \$47 a ton.

Structural Material.—A very heavy tonnage is being placed and the American Bridge Company have taken some large contracts. They have just closed with the

Pittsburgh, Carnegie & Western Railroad for 15,000 tons of viaduct work, making a total of 30,000 tons of bridge work ordered from the American Bridge Company by this road. Monongahela Construction Company have closed a contract for the superstructure for the Monongahela River Bridge at Clairton, Pa., using 3000 tons. Pennsylvania Lines West have purchased a bridge over the Scioto River to Columbus, Ohio, three spans, double track work; also the Miami River Bridge, being three spans, double track. The Wheeling & Lake Erie Railroad have closed for 15,000 tons of girder and pin connected work. Lake Shore & Michigan Southern have closed for an additional building to the shops at Collingwood, Ohio, amounting to \$160,000. In addition to above a great many smaller contracts have been placed and the mills are practically filled up to October or later, and deliveries of Structural Shapes seem to be getting further behind right along. The Carnegie Steel Company are having material rolled at several outside works. The tonnage this year will be very much in excess of any previous year in the history of the structural trade. There has been no official change in prices, which are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh. Actual prices of Beams and Channels are from 1.80c. to 2c., while small lots for prompt shipment bring 2.25c. and higher.

Plates.—Nothing of special interest to note in the Plate trade. The mills are booking a moderate tonnage, but are able to make prompt deliveries. We quote: Tank Plate, 1/4 inch thick and up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, \$2 extra; gauges Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days. Small lots of Plates from store are sold on the basis of 1.70c. to 1.75c. for Tank, with the usual advances for the higher grades.

Muck Bar.—The market is active, and sales at \$32 a ton are reported to have been made to consumers in the Pittsburgh district.

Ferromanganese.—Domestic is held at \$52 to \$55 a ton, depending on the order, while German Ferro can be bought at \$50 a ton in large lots delivered in this district.

Spelter.—We quote at 4.15c. to 4.20c. for Prime Western Spelter delivered in this district. A sale of 25 tons is reported at the lower figure.

Sheets.—A good deal of tonnage is being placed, and as a rule the mills are filled up for the next two or three months. The heavier gauges are particularly active, and it is said Black Sheets, running 10 to 14 gauge, have been imported. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 3c. to 3.10c.; No. 28, 3.10c. to 3.15c. It is probable that on large contracts for Sheets for extended delivery some of the mills would name prices corresponding with those of the leading Sheet interest, which are slightly lower than the above. Jobbers quote small lots of No. 27 at 3.15c. to 3.25c. from store. We quote Galvanized Sheets at 70, 10 and 5 off in carloads, and 70 and 10 to 70 and 5 in small lots. These prices are f.o.b. maker's mill.

Bars.—A very heavy tonnage in Steel Bars has been placed by the agricultural interests and other consumers, in order to get the benefit of the 1.50c. price which is being named by the mills for 500-ton lots or over, if booked prior to April 1. The general market on Steel Bars for carload shipments is 1.60c., at mill, half extras, while 1.70c. to 1.75c. is being quoted for small lots. All specifications for less than 2000 pounds of a size are subject to the following differential extras: Quantities less than 2000 pounds, but not less than 1000 pounds, 0.05c. per pound extra; quantities less than 1000 pounds,

but more than 500 pounds, 0.15c. per pound extra; quantities 500 pounds or less, 0.25c. per pound extra; the total weight of a size to determine the extra, regardless of length. A heavy tonnage in Iron Bars is also being placed, and the minimum price of 1.70c., Pittsburgh, for shipment East and West, extras as per National Bar Iron Card, is being rigidly held. One leading producer of Bar Iron is said to be filled up for about four months.

Merchant Steel.—Some heavy contracts have been placed by Implement manufacturers, and the outlook is that the mills will have all the work they can do for the balance of this year. Prices are very strong, and we quote Toe Calk Steel at 2.10c., base, in large lots and up to 2.25c. for small lots. Tire Steel is 1.80c. to 1.90c. and Open Hearth Spring 2.25c. to 2.50c. Prices on Cold Rolled and Cold Drawn Shafting are 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered to all points east of the Mississippi and north of the Ohio rivers. Tool Steel, ordinary grades, is 6½c. to 7c., and special grades 12c. and upward, on which the mills allow freight.

Skelp.—The market is very active, and Grooved and Sheared Iron Skelp is held at 1.95c. to 2.10c., Pittsburgh, depending on the order and sizes. Steel Skelp is quoted at about the same prices as Iron.

Merchant Pipe.—A very heavy tonnage is being placed, much larger than at this time last year. During the week a 4-inch and a 6-inch gas line have been placed. The market is very firm, and discounts on carloads to jobbers are as follows:

Merchant Pipe.	Black. Per cent.	Galvd. Per cent.
½ to ¾ inch, inclusive.....	60	48
¾ to 12 inch, inclusive.....	67	55

Boiler Tubes.—The boiler makers' strike at Cleveland, and which may extend to Pittsburgh, is affecting demand for Boiler Tubes to some extent. Discounts to the small trade are as follows:

Boiler Tubes.	Up to 22 feet. Per cent.
Steel.	
1 inch to 1½ inch, inclusive.....	47½
2¾ inch to 5 inch, inclusive.....	65½
1¾ inch to 2½ inch and 6 inch to 13 inch, inclusive..	60
Iron.	
1 inch to 1½ inch and 2½ inch.....	43½
1¾ inch to 2½ inch.....	43
2¾ inch to 13 inch.....	53

Iron and Steel Scrap.—There is a heavy consumption of Scrap of nearly all kinds, and the efforts of consumers to keep prices from advancing are apparently not meeting with much success. Scrap of nearly all kinds is higher, and Low Phosphorus Melting Stock is said to have sold at \$22 to \$23 in gross tons. Billet and Bloom Ends, used in Open Hearth and Bessemer practice, are \$18.50 to \$19 gross ton. No. 1 Wrought Scrap is \$17.50 to \$18 net ton.

Coke.—The report of the *Courier* shows 21,395 ovens in the Connellsville region, of which 20,578 were active last week and only 817 idle, the output having been 214,549 tons and shipments 9238 cars. The supply of cars and motive power is reported to be much better, but is not yet satisfactory to Coke shippers by any means. It is intimated that the price of strictly Connellsville Furnace Coke for last half of the year will be \$2.50 a ton. The price for the first half of this year was \$2.25, but spare lots have been bringing as high as \$3 a ton. Foundry Coke is \$2.75 to \$3 on contracts, but for prompt shipment it has sold as high as \$3.50 a ton. Main Line Coke is also sold at about the above prices, as for some time it has been a question of getting Coke, the quality not cutting so much figure as it did when Coke was more easily obtainable.

Thomas A. Mack & Co., Pig Iron brokers, of Cincinnati, have opened a branch office in the Empire Building, Pittsburgh.

On March 17 a decree was issued by the Spanish Government establishing an eight-hour day for all working people on the State domains and in the State mines, workshops, &c., and providing that each hour of overtime is to be paid for at the rate of one-eighth of the daily wage.

New York.

NEW YORK, March 19, 1902.

Pig Iron.—It is becoming increasingly difficult to quote the market, since everything depends upon the deliveries and the necessities of the buyer. As a rule the quantities required for urgent delivery are small, but as high as \$21 and \$22 has been paid at New England points. Some fair sized sales have been made for forward delivery. Some Scotch Iron has been bought for importation, but the quantity thus far is small. We quote for forward delivery, Northern Irons: No. 1, \$19.25 to \$19.75; No. 2 X, \$18.25 to \$18.75; No. 2 Plain, \$17.75 to \$18.25; Gray Forge, \$17.25 to \$17.50 at tidewater; Tennessee and Alabama brands, No. 1 Foundry, \$16.75 to \$17; No. 2 Foundry, \$16.25 to \$16.75; No. 1 Soft, \$16.75 to \$17; No. 2 Soft, \$16.25 to \$16.50; No. 3 Foundry, \$15.50 to \$15.75; No. 4 Foundry, \$15 to \$15.50; Gray Forge, \$15 to \$15.25.

Cast Iron Pipe.—There is heavy inquiry. It is estimated that there are now on the market orders aggregating about 60,000 tons, which are likely to be closed at an early date.

Steel Rails.—Inquiries continue good both for railroads and for suburban trolley lines. The tonnage required for the latter is becoming more and more important. Montreal reports indicate that a lot of 20,000 tons for the Canadian Pacific road has been placed in Germany with Krupp and with Bochum. We continue to quote \$28 for Standard Rails at Eastern mill.

Finished Iron and Steel.—Among the orders placed locally for Structural Material is 2000 tons for the Corn Exchange Bank and about 3000 tons for three large new piers to be built in Brooklyn. A very large job in sight is the Transit Hotel, at Forty-second street, which is expected to call for between 6000 and 7000 tons of material. The American Bridge Company have taken quite a number of large orders. These include 15,000 tons for the Pittsburgh extension of the Wabash, which brings the total for that new road up to about 35,000 tons, 1750 tons for five street crossings of the Pennsylvania Lines West, at Pittsburgh; 2800 tons for the Collingwood shops of the Lake Shore; 1000 tons for track elevation in Chicago for the Northwestern; 900 tons for the Kansas City Southern; 1800 tons for the Atchison, Topeka and Santa Fé, and 750 tons for the Titusville Iron Company of Titusville, Pa. Prices generally remain nominally unchanged, but they are actually working up higher on Structural Shapes. There is considerable inquiry for foreign Shapes, but importers do not appear to be doing much. Prices are quoted as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.95c.; Angles, 1.75c. to 1.90c.; Tees, 1.80c. to 1.90c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.78c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange and 3.40c. for Fire Box. Refined Bars are 1.80c. to 1.85c.; Soft Steel Bars, 1.80c. to 1.85c.

Metal Market

NEW YORK, March 19, 1902.

Pig Tin.—While the price of spot has been maintained, and has even been advanced since last week, these prices are purely artificial, as they do not even tempt purchases. Business is of the very slowest nature. Throughout the whole week, in the face of the apparent strength of spot, futures remained lower and were entirely neglected. At the close to-day spot was quoted 26½c. March quotations were 25½c. to 26c., and April brought out nothing higher than 25c. The London market continued to advance, reaching £115 15s. for spot, and £112 7s. 6d. futures. Business abroad was also very light. Arrivals during the week have been freer.

Copper.—The market has fallen back into a dull and uninteresting condition. Everything is extremely quiet and the market is in the buyers' favor. Purchasers are not showing themselves, however, as there is a general belief that prices will go lower. The important consumers are still well supplied, and smaller users are buying only in a retail way according to their im-

mediate requirements. Prices are quite nominal. Lake is quoted 12½c. to 12¾c., and both Electrolytic and Casting are quoted 12c. to 12¼c. London prices have declined materially, closing cables to-day naming spot £52 17s. 6d. and futures £52 15s. Best Selected declined just £1 since last week, being quoted to-day £57 10s. Exports continue on a very large scale. Thus far this month they amounted to 12,600 tons. It is expected that for the entire month the exports will amount to fully 18,000 to 20,000 tons. The heavy shipments are attributed entirely to the covering of previous sales.

Pig Lead.—There is no change in the situation. Demand is very light and business in general very poor. The price of the American Smelting & Refining Company is unchanged at 4.10c., New York; Desilverized, 15 days, and 4.12½c. for spot. London has advanced a shade to £11 10s.

Spelter.—While there is a good deal of bullish talk and prices have advanced considerably, business is said to be rather light. Spot is considered rather scarce and brought 4.35c. Shipments from the West are offered at this figure. St. Louis is quoting 4.07½c. to 4.10c. London closed entirely unchanged from last week with £17 15s.

Antimony—is unchanged. Hallett's is quoted 8c. to 8½c.; Cookson's, 10¼c., and outside brands, 7½c.

Nickel.—Ton lots are quoted at 50c. The market is unchanged.

Quicksilver.—Prices are on a basis of \$48 per flask of 76½ lbs. in lots of 56 flasks or more.

Tin Plates.—The market is entirely unchanged. The American Tin Plate Company are quoting for delivery until July 1 on a basis of \$4.19 per box of standard 100-lb. Cokes, f.o.b. New York, or \$4 f.o.b. Pittsburgh district.

John Stanton reports the copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 lbs.:

	Reporting mines.	Outside sources.	Total	U. S. foreign product.	U. S. foreign mines.	U. S. foreign exports.
First half 1895.....	70,612	9,100	79,712	42,484	34,215	
Second half 1895.....	84,885	6,600	91,485	43,674	30,507	
Total 1895.....	155,497	15,700	171,197	86,178	64,722	
First half 1896.....	94,180	7,200	101,380	42,255	58,216	
Second half 1896.....	95,314	7,200	102,514	43,941	67,287	
Total 1896.....	199,494	14,400	203,894	86,196	125,503	
First half 1897.....	103,651	5,000	108,651	44,263	64,870	
Second half 1897.....	100,555	6,900	107,455	44,007	64,340	
Total 1897.....	204,206	11,900	216,106	88,270	129,210	
First half 1898.....	112,687	7,800	120,487	46,880	68,284	
Second half 1898.....	103,535	10,250	113,785	43,674	76,831	
Total 1898.....	216,222	18,050	234,272	84,554	145,115	
First half 1899.....	111,987	12,500	124,487	43,629	56,460	
Second half 1899.....	118,818	18,900	137,719	45,611	63,351	
Total 1899.....	230,806	31,400	262,206	89,240	119,811	
First half 1900.....	114,177	20,400	134,577	43,153	90,747	
Second half 1900.....	113,810	20,400	134,104	46,278	69,335	
Total 1900.....	227,987	40,800	268,681	89,431	160,082	
First half 1901.....	112,794	20,600	133,394	46,847	59,027	
Second half 1901.....	110,561	21,300	131,861	53,394	44,339	
January, 1902.....	15,155	3,800	18,955	7,367	15,021	
February, 1902.....	16,931	3,400	20,331	8,475	16,108	

The Empire Iron & Steel Company.—The Empire Iron & Steel Company have been organized and will build a plant at Niles, Ohio, for the manufacture of iron and steel sheets. The concern have secured 15 acres of land at Niles and will probably buy 15 acres more. The promoters of the company are Wade A. Taylor of Niles, Charles S. Thomas of Struthers and Jno. F. Odea of Youngstown. The initial plant will consist of four sheet mills and a bar mill, as it is the intention of the concern to roll their own bars. A galvanizing plant will also be erected to make galvanized sheets. The new concern will also roll small sections of T rails and state the rail mill will have an output of about 100 tons in 24 hours. Chas. S. Thomas was secretary of the Struthers Iron & Steel Company until the formation of the American Sheet Steel Company, since which time he has been manager of the Struthers Works of this concern.

A New Sheet Mill at Niles.—Wade A. Taylor, Charles L. Thomas and others have organized a company and will build a four-mill sheet plant, at Niles, Ohio. Plans for the new work have not been completed, but are now under way, and it is expected active work on erection will be started in a short time.

The German Steel Works.

The Producers of Billets, Rails and Beams.

Our German correspondent has furnished us with the following list of the producers of steel billets, steel rails and beams in Germany.

In this list the letter B indicates that the company make billets, the letter G that they produce beams and the letter R that they make steel rails:

Rhineland Westphalia.

Aachener Huette Actien Verein, Rothe Erde bei Aachen, B. G. R.
Bochumer Verein fuer Bergbau u. Gussstahlfabrication, B. R.
Gewerkschaft Deutscher Kaiser, Bruckhausen, Rhein, B. G. R.
Elsen u. Stahlwerk Hoesch, Dortmund, B. G. R.
Gesellschaft fuer Stahlindustrie, Bochum, R.
Gutthoffnungshuette, Oberhausen, B. G. R.
Hasper Eisen und Stahlwerk, Haspe in W., G.
Hoerder Bergwerks u. Huette Verein, Hoerde, B. G. R.
Fried. Krupp, Essen, B. R.
Phoenix, Saar bei Ruhrort, B. R.
Rheinische Stahlwerke, Melderich, B. G. R.
Union Act. Ges., Dortmund, B. G. R.
Westfaelische Stahlwerke, Bochum, B. G. R.
Gebr. vander Zypen, Koeln-Deutz, B.

Lorraine.

Lothringer Huette-Verein, Knettingen, B. G. R.
Rombacher Huetteverke, Rombach, B. G. R.
De Wendel & Co., Hayingen, B. G. R.

Saar District.

Burbacher Huette, Burbach, B. G. R.
Dillinger Huetteverke, Dillingen, B. G. R.
Eisenwerk Kraemer, St. Ingbert, B. G. R.
Gebr. Ruechling, Voelkingen, B. G. R.
Gebr. Stumm, Neunkirchen, B. G. R.

Bavaria.

Maximilianshuette, Rosenberg, B. G. R.

Luxemburg.

Eisenhuette Act. Ver., Dueldelingen, B. G. R.
Deutsch-Luxemburgische Gesellschaft, Differdingen, B. G. R.

Hanover.

Georgsmarienbergwerks-u. Huette Verein, Osnabrueck, G. R.
Feiner Walzwerk, Peine, B. G. R.

Saxony.

Koenig Albert Werk, Zwickau, B. G. R.
Koenigin Marienhuette, Cainsdorf, B. G. R.
Saechsische Gussstahlfabrik, Deuben, B. R.

Upper Silesia.

Bismarckhuette in Bismarckhuette O. S., B. R.
Borsigwerk in Borsigwerk O. S., B. R.
Friedenshuette in Friedenshuette O. S., B. G. R.
Koenigs and Laurahuette in Koenigs huette O. S., B. G. R.

The Riter-Conley Mfg. Company.—The new Water street office building of the Riter-Conley Mfg. Company of Pittsburgh, builders of steel construction of all kinds, which has been under construction for some months, is about completed. The firm held a reception in their new office on Saturday, March 15, and the new building and its appointments were very much admired by visitors. Especial attention has been given in the new office building to accommodate the drafting department, a large force of draftsmen being employed constantly by the concern. The Riter-Conley Mfg. Company operate very large structural shops on Preble avenue, Allegheny, and also on Water street, in Pittsburgh. The firm bought about a year ago a large site of land at Leetsdale, on the Pittsburgh, Fort Wayne & Chicago Railway, about 15 miles from Pittsburgh, and on this site large new shops are being built. The business of the concern has grown rapidly in the last few years and larger works were necessary. The new works at Leetsdale will be in operation some time in the summer. The firm have many large contracts on hand, and did most of the work in the new plant of the Dominion Iron & Steel Company, at Cape Breton, Nova Scotia. The officers of the concern are Thomas B. Riter, president; William C. Coffin, vice-president; John S. Craig, secretary and treasurer, and Robert A. McKean, general manager. The firm have branch offices at 39-41 Cortlandt street, New York City.

Thomas Kennedy has resigned as secretary of the American Steel Casting Company, at Sharon, Pa., to accept a similar position with the Sharon Foundry Company. He was presented with a gold watch by former employees upon his retirement.

The New York Machinery Market.

NEW YORK, March 19, 1902.

There is no change in the general situation. In the machine tool trade some good orders were placed. They included principally heavy tools, however, and will not affect deliveries on the smaller classes of standard tools, which can now be had quite promptly.

The heaviest purchases of the week were made by the Baltimore & Ohio Railroad. This deal has been pending for a number of months. As previously stated in *The Iron Age*, the list included some ninety tools. Orders for the major portion of this equipment were awarded to the Niles-Bement-Pond Company. The orders for the boring mills were awarded to the Bullard Machine Tool Company. This order includes five 37-inch mills and three 51-inch machines. A portion of the machinery is yet to be decided upon. The matter is now being closed and it is expected that within a few days the entire machine tool equipment will have been purchased.

For installation in their new shops at Readville, Mass., the New York, New Haven & Hartford Railroad placed the bulk of their orders last Thursday and Friday. The orders awarded footed to upward of \$100,000 and included principally the heavy machinery equipment. The orders were well scattered among the large houses in this city and the builders of heavy machine tools direct. The New York, New Haven & Hartford Railroad are now about to close on another large lot of machine tools. The matter is being handled quietly and we were unable to learn the destination of this lot.

The Pennsylvania Railroad are obtaining prices and data on a quantity of promiscuous tools which in the aggregate will make a very good showing. The matter is not sent out in a complete list. The various purchasing agents of the road have the matter in charge. It is expected in the trade that, in view of the very liberal appropriations of this company to their equipment account, purchases of machinery this year will be unusually heavy.

The Philadelphia & Reading Railroad have commenced purchasing the foundry equipment to be used in connection with their new shops at Reading. An order for two pressure blowers, each with a capacity of 45 cubic feet per revolution, was awarded to the Connersville Blower Company of Connersville, Ind., and 95 Liberty street. They will be direct connected to several electric motors.

Purchases of machine tools are being made by the De Laval Steam Turbine Company of 74 Cortlandt street, New York. The equipment is for their new shop at Trenton. When operations were commenced in these works only a small portion of the equipment was installed. The balance is now being secured.

The Jones & Lamson Machine Company of Springfield, Vt., inform us that they intend building a large three-story fire proof shop. The plans are not fully matured, however, and no equipment has been secured as yet. W. D. Woolson, the treasurer of the company, has the matter in charge.

Harry G. Skinner, president and treasurer of the Wm. Skinner & Sons' Shipbuilding & Dry Dock Company of Baltimore, Md., advises us that a meeting of the stockholders of the company will be held to decide upon the extension of their plant. It is intended to erect a very complete shop and install modern equipment for machine and boiler work and hull repairing.

The Hartford Carpet Corporation of Hartford, Conn., have given official confirmation to the report which we recently printed regarding their erection of a new plant at Thompsonville, Conn. The plant will be operated electrically. A 4000 horse-power electric plant will be installed. There will be a tapestry mill, 900 x 100 feet; a worsted mill, 500 x 110 feet, and a dye house, 300 x 100 feet. None of the machinery has been purchased.

The Standard Light, Heat & Power Company of Sidney, N. Y., who have just obtained a franchise for furnishing Unadilla and Bainbridge, N. Y., with electric power, are shopping about for a 300 horse-power engine. The company are operating a large electric water power

plant at present. E. G. Allen is the company's engineer.

The recently organized Shuttleworth Bros. Carpet Company, Amsterdam, N. Y., are in the market for a 120 horse-power boiler, dynamos, shafting, pulleys, &c., for the improvements they are to make to their mills. The officers are H. L. Shuttleworth, president; John Shuttleworth, vice-president, and Walter W. Shuttleworth, secretary and treasurer.

The recently incorporated Elmira Rolling Mill Company, Elmira, N. Y., are in the market for two 350 horse-power engines. David Townsend of Philadelphia has purchased some of the machinery required by this concern. E. E. Buchanan is the president of the company.

The Buffalo Forge Company of Buffalo, N. Y., with New York office at 41 Cortlandt street, are supplying the American Smelting & Refining Company, at Perth Amboy, N. J., with a heating and ventilating plant. They are also putting a small heating plant in Siegel & Cooper's store, Eighteenth street and Sixth avenue, and a drying plant in Abendroth & Root Mfg. Company, at Newburgh, N. Y., for drying all sorts of galvanized iron work. This plant is to be used for drying galvanized iron pipe and sheets as it is taken out of its acid bath. Heretofore the method for drying has been using direct steam, whereas, through the substitution of this system, the time has been reduced one-fourth of that formerly used. Another advantage is the saving of space occupied by the drying plant.

The Clark Thread Works of Kearney, N. J., have decided to carry out their long mooted plans for a central power station. An order for 20 water tube boilers of 250 horse-power each has just been awarded to the Coatesville Boiler Works of 141 Broadway. The Watts-Campbell Company of Newark, N. J., received an order for a 3000 horse-power engine. The Green Fuel Economizer Company of 74 Cortlandt street were awarded an order for a 5000 horse-power fuel economizer. The object of the company is to concentrate the power plants furnishing power to the various mills into one building or central station. The contracts for the electrical equipment and steam accessories have not been placed.

R. N. King of 49 Wall street will soon be ready to receive bids on a 20,000 horse-power hydraulic-electric plant. Details are not yet to be had.

The contract for the engines to be employed in the new Astor Hotel, Fifty-fifth street and Fifth avenue, has been awarded to the Harrisburg Foundry & Machine Company of 203 Broadway. The entire installation aggregates 1500 horse-power. There will be two 450 and two 300 horse-power units. The engines will be of the Harrisburg standard four-valve type. They will be high speed and direct connected to Western Electric generators. The Harrisburg Company also obtained the order for the two engines purchased by the Consumers' Electric Light & Power Company of Easton, Pa. One of these will be a 450 horse-power cross compound, and the other a direct connected 150 horse-power. Sterling boilers were purchased.

The contract for the steel stack which is to be built in the new Macy Building, at Broadway and Thirty-fourth street, New York, was awarded to the Coatesville Boiler Works of 141 Broadway. The stack will be 237 feet high and 10 feet in diameter.

Among the orders recently received by the C. W. Hunt Company of West New Brighton, Staten Island, New York, have been the following: A complete installation of coal handling machinery, together with automatic railway and industrial track for the United States Naval Coaling Station, Langley Point, Manila; Industrial Railway installation for the Vulcanite Portland Cement Company, Vulcanite, N. J.; Industrial Railway, including cars, for the Townsend & Downey Shipbuilding & Repair Company, Shooter's Island, N. Y.

Armstrong Bros. Tool Company of Chicago report a marked increase recently in the export demand for their tool holders. They have recently established agencies in Australia and New Zealand which give every promise of developing into important markets for the company's product. Some time ago the company sent Mr. Nestor Johnson into Norway, Sweden and Denmark to investigate that market and to introduce the Armstrong tools.

Mr. Johnson, who is a native of Norway and a practical mechanic of wide experience, met with the most gratifying success. He has recently returned to Chicago after placing the Armstrong agency for the countries of Norway, Sweden and Denmark with the firm of C. S. Christensen of Christiania, Norway. Mr. Johnson relates many interesting experiences which he had while traveling in the company of one of C. S. Christensen's engineers, visiting the largest machine shops in the countries above named. One of the most interesting of these occurred at the plant of the Moss Mechanical Works at Moss, Norway, while making a demonstration of the Armstrong gang planer tool at the request of Mr. Karl Olsen, superintendent of the works. The subject of the test was a large cast iron plate used in connection with pulp mill machinery and Superintendent Olsen announced their regular time on this job as seven hours. Mr. Johnson and the gang planer tool finished it in just $1\frac{3}{4}$ hours. Numerous large orders for Armstrong tools and self hardening steel sent in subsequently by C. S. Christensen testify to the practical and convincing nature of Mr. Johnson's work and the merits of the tools he introduced.

A. L. Eccles Company, 127 Duane street, have been appointed New York sales agents of the Keystone Drop Forge Works of Germantown Junction, Philadelphia.

The Camp Engineering Company, 47 West Lake street, Chicago, request catalogues of gas and gasoline engines.

Anti-Trust Laws Must Not Discriminate.

Legal decisions adverse to the anti-trust laws of Illinois are coming quite close together. A few weeks since we commented on the fact that Judge Tuley of one of the local courts of that State had rendered a decision in which he said that it was a matter of doubt if Illinois now had a law against trusts which was capable of being enforced. His opinion was sound, as the Supreme Court of the United States on the 10th inst. declared the Illinois anti-trust law invalid. The statute rendered nugatory by this decision is one of the most drastic of the anti-trust laws passed by the various States. Among other provisions of this law is one permitting a debtor of any firm or corporation belonging to a combination or trust to set up the plea that the firm or combination was a member of a trust and this was to constitute a sufficient defense against the collection of the amount claimed. It happened, however, that section 9 of the law set forth that the provisions of the act should not apply to agricultural products or live stock while in the hands of the producer or raiser. This has from the first been regarded as a weak feature of the enactment, and constitutional lawyers have strenuously maintained that it invalidated the remainder of the statute.

The case which drew out the United States Supreme Court's decision was an appeal from the United States Circuit Court at Chicago in the suit of the Union Sewer Pipe Company of Ohio against some Chicago contractors, who had refused to pay for material purchased. It was apparently an easy way to make money, and they took advantage of the protection afforded them by the law. The Circuit Court decided in favor of the pipe company, and the decision in the Supreme Court was made on the appeal of the defendants against the judgment of the lower court. The decision was handed down by Justice Harlan, who held that the act is repugnant to the Constitution of the United States unless its ninth section can be eliminated. The exemption of agricultural and live stock raisers is in conflict with the Constitution, violating the Fourteenth Amendment, which declares that "No State shall deny to any person within its jurisdiction the equal protection of the laws."

This decision completely nullifies anti-trust enactments in the State of Illinois and leaves the way open for the free operation of trusts, combinations or consolidations until future legislation can be accomplished on such broad lines as to be applicable to everybody, including agriculturists and other classes of people who have hitherto sought exemption. It further annuls

legislation of this character in a large number of States in which exemptions of the same character had been provided for farmers or other persons connected with agricultural interests. The more this subject is considered from a legal standpoint, and the greater the number of decisions rendered on the trust question, the more decidedly is the principle established that if any legislation of this kind is to be accomplished it must be of universal application. Law makers have been particularly tender in dealing with those who are connected with farming interests. Their efforts have been directed against those who are presumably dependent on farmers for their patronage. The farmer has been adjudged to be in need of protection from all other interests, because they have been regarded as disposed to prey upon him. This is certainly a very inequitable view to take of the relations of the varied elements which constitute society or which enter into the composition of the business interests of a community or a commonwealth.

It appears that a very large number of other cases are pending in State and United States courts against corporations in connection with anti-trust statutes in Illinois and other States having similar laws, and these will all be affected by the Illinois decision. It remains to be seen whether the legislatures of these States will reconstruct their statutes so as to make them universally applicable. Predictions are freely made that in very few States will public sentiment demand such legislation. In Illinois especially a great change has been observed since the headquarters of so many large corporations were removed to other States in which hostility toward them was less pronounced. It is conceded that the State simply lost financial prestige, with no benefit to the customers of the great corporations.

An interesting statement in this connection is made by the *Farm Implement News* of Chicago. Some years since a suit was brought by the receivers of the now defunct National Cordage Company against an Illinois jobbing house to recover \$80,000 for binder twine sold to the latter. The jobbing house, while acknowledging the indebtedness, plead the anti-trust law in defense and the plea was sustained. Being in the throes of dissolution, the twine trust lacked the nerve to appeal to a higher authority. The company bowed to the court's decision, charged the amount involved to profit and loss, and dropped the matter. A fitting sequel to this occurrence was the subsequent failure of the jobbing house and its passage out of existence.

The Sheet Mill Wage Agreement.—At a meeting of officials of the American Sheet Steel Company and representatives of the Amalgamated Association of Iron, Steel and Tin Workers, held in the Vandergrift Building last week, an arrangement for a continuous sheet wage scale was made. The present scale expires June 30, but under the terms of the contract made last week there will be no stop of work pending the formation of a new wage scale, should one not be agreed upon by the time the present scale expires. The agreement is something similar to that recently made between the Amalgamated Association and the American Tin Plate Company, and insures steady work in the sheet mills through the summer months. The agreement will have to be ratified by the Amalgamated Association at their convention in Wheeling in May, but no trouble is expected on this score.

The International Association of Bridge and Structural Iron Workers have not yet come to a settlement with the American Bridge Company in regard to wages to be paid after May 1. The unions demand 50 cents per hour in the following cities: Chicago, New York, Pittsburgh, Newark, Philadelphia, Cleveland, St. Louis and Wheeling; 40 cents per hour in Buffalo, Milwaukee, Omaha, Denver and Richmond; 40 cents per hour in Boston, Washington, Kansas City, Albany, Minneapolis, Scranton, Cincinnati, Salt Lake City, San Francisco, Portland, Indianapolis and all sections outside those described. In Baltimore and Detroit \$3.50 per day of eight hours is demanded.

Iron and Industrial Stocks.

The week has been uneventful, but on the whole values have been well maintained, and in quite a number of issues a slightly higher level of values has been attained. Among those which have risen are Car & Foundry common, Colorado Fuel & Iron, International Silver common, which has advanced from 8½ to 11½; Pennsylvania Steel preferred, Republic preferred and Tennessee. During the week United States Steel preferred has held quite steady at 95 to 95½.

Sloss-Sheffield.—The annual report of the Sloss-Sheffield Steel & Iron Company for the fiscal year ending November 30, 1901, contains the following data:

	1901.	1900.	Changes.
Profits on pig iron....	\$311,407	\$742,852	Dec. \$431,445
Profit on coal.....	151,445	173,718	Dec. 22,273
Profit on coke.....	59,382	83,163	Dec. 23,781
Ore and dolom. sales..	35,597	1,359	Inc. 34,238
From No. Ala. Fur....	17,556	.....	Inc. 17,556
Royalties, &c.....	3,362	2,472	Inc. 890
Rents, storage, &c....	136,368	140,789	Dec. 4,421
Interest on exchange.	14,003	34,313	Dec. 20,310
Total profits.....	\$729,120	\$1,178,666	Dec. \$449,546
Expenses, taxes and license	62,677	78,242	Dec. 15,565
Net earnings.....	\$666,443	\$1,100,425	Dec. \$433,982
Bond interest.....	203,812	202,575	Inc. 1,237
Balance	\$462,631	\$897,850	Dec. \$435,219
Dividends paid.....	469,000	351,750	Inc. 117,250
Deficit	\$6,369	sur. \$546,100	Inc. \$552,469
Previous surplus.....	546,100	.....	Inc. 546,100
Profit and loss surplus	\$539,731	\$546,100	Dec. \$6,369

The general balance sheet as of November 30 shows:

	1901.	1900.	Changes.
Assets—			
Property account.....	\$17,608,032	\$17,283,563	Inc. \$324,469
Raw and refined mat..	314,337	504,831	Dec. 190,494
Stocks in Co.'s store..	168,233	137,640	Inc. 30,593
Treasury securities...	262,782	422,477	Dec. 159,695
Cash in bank.....	114,612	377,171	Dec. 262,559
Bills receivable.....	18,848	101,543	Dec. 82,695
Accounts receivable...	913,345	675,295	Inc. 238,050
Repair and rent acc't.	64,655	.....	Inc. 64,655
Interest and taxes unexpired	8,079	7,256	Inc. 823
Total.....	\$19,472,923	\$19,509,776	Dec. \$36,853
Liabilities—			
Capital, common.....	\$7,500,000	\$7,500,000	.....
Capital, preferred....	6,700,000	6,700,000	.....
First mortgage bonds..	2,000,000	2,000,000	.....
General mortgage bonds	2,000,000	2,000,000	.....
Repair and Ren. fund.	.....	109,838	Dec. \$109,838
Payment on Adler purchase	164,397	150,900	Inc. 13,497
Current accounts.....	497,496	429,396	Inc. 68,100
Pay rolls.....	71,300	73,542	Dec. 2,242
Profit and loss surplus	539,730	546,099	Dec. 6,369
Total.....	\$19,472,923	\$19,509,776	Dec. \$36,853

A comparative statement of the company's output in tons for the past two years follows:

	1901.	1900.	Changes.
Pig Iron.....	218,857	210,268	Inc. 8,589
Coal	1,042,298	1,053,524	Dec. 11,226
Coke	339,199	367,989	Dec. 28,790
Brown ore.....	234,661	129,502	Inc. 105,159
Red ore.....	221,789	243,125	Dec. 21,336
Dolomite	101,349	118,087	Dec. 16,738

The output of pig iron, coal, coke, red ore and dolomite was very materially reduced, due for the most part to the fact that during the summer months, when there was little demand for domestic coal and coke, three of the Birmingham district furnaces were out of blast at one time for a brief period and two of them for quite a prolonged period. This also had the effect of increasing in a marked degree the cost of producing raw material. The output of coal and coke has also been greatly reduced by the almost continuous car shortage which has prevailed during the greater portion of the year. At the date of this report, March 1, 1902, the output of iron has been increased until it is now at the rate of over 300,000 tons per annum, with five furnaces in blast and two additional furnaces to be blown in within 60 days. The comparison of prices obtained for iron in the years 1901 and 1900 follows:

	1901.	1900.	Changes.
Average price received on pig iron.....	\$10.51	\$13.78	Dec. \$3.27
Profit on pig iron shipments	\$311,407.19	\$742,852.19	Dec. \$431,445.00

The cost of production of iron decreased 85 cents per ton, compared with 1900. There were expended during the year in the acquisition of property, development and improvement of furnaces and other property \$512,173 in excess of depreciation and renewal fund. President E. O. Hopkins says that the prospect is

most encouraging. The results of the first quarter of 1902 are known and are 63 per cent. greater than in the corresponding period of 1901. Sales have been made covering the production of the second and third quarters of the present fiscal year at prices which reasonably insure earnings of \$1,200,000 over and above bond interest and other fixed charges for the year ending November 30, 1902.

Within a few days the official circular from the United States Steel Corporation is expected, which will give the details of the proposed plan for the conversion of a part of the preferred stock into bonds. As outlined the plan is to give holders of the preferred stock the privilege to convert 40 per cent. of their stock into a 5 per cent. second mortgage bond. This would mean an issue of about \$200,000,000 of bonds. In addition thereto, there are to be issued \$50,000,000 of 5 per cent. second mortgage bonds to provide additional capital. The preferred stock will have the privilege to subscribe to this issue in proportion to holdings. The greater part of the new money is needed to carry out betterments to the plants of the constituent companies aggregating over \$30,000,000. This includes \$10,000,000 for the National Tube Company, who are to build a new Bessemer plant and tube works at Wheeling, W. Va. Otherwise the greater part of the money is to be spent in the Pittsburgh district. It is assumed that a part of the balance may be used to take over the property of the American Can Company. It is figured out that in this manner the company will save about \$1,500,000 per annum in fixed charges. If the preferred interest be regarded as a fixed charge. On the other hand, the holders of preferred stock surrender 2 per cent. interest on 40 per cent. of their holdings, and have \$50,000,000 ahead of their balance of stock. The bonds have been dealt in on the curb at close to 100, which would indicate a profit; but on the other hand, it is quite impossible to judge what valuation will be put on the residuary preferred stock, after the conversion plan has been effected. It is understood that a sufficient total of stock has been pledged to the new scheme to make it operative, so that outside holders have the alternative to join in it, or have their preferred stock take a place behind the second mortgage bonds.

It is reported that the Standard Underground Cable Company of Pittsburgh contemplate an increase in their capital stock, and that a meeting of the directors will be held soon to take action on the matter. The stock of this concern advanced on the Pittsburgh Stock Exchange from \$216 to \$240 last week.

Dividends.—The American Stoker Company have declared the regular quarterly dividend of 2 per cent. on their preferred stock, payable April 15 to stock of record March 31.

The Colorado Fuel & Iron Company have declared a quarterly dividend of 1¼ per cent. on their common stock, payable April 15.

The International Steam Pump Company have declared a quarterly dividend of 1 per cent. on their common stock, payable April 1. Books close March 20 and reopen April 2.

The Geo. A. Fuller Company have declared 1¼ per cent. on the preferred stock, payable April 1. Books close March 21, reopen April 20.

The directors of the American Smelting & Refining Company have declared the regular quarterly dividend of 1¼ per cent. on the preferred stock.

The Pittsburgh Coal Company and other large coal concerns at Pittsburgh issued telegraphic orders on Tuesday night, March 18, to begin the shipment of coal for the lake trade on Wednesday, March 19. The shipment of lake trade coal means the demand for thousands of additional cars in the Pittsburgh district, which is already suffering on account of there being fully 40 per cent. less cars than are absolutely needed for business.

It is stated that the weighers will ask for a material advance in wages at the annual convention of the Amalgamated Association to be held in Wheeling next month.

HARDWARE.

THE election of a representative of a prominent manufacturing house to membership in the Chicago Retail Hardware Dealers' Association, as referred to in another column, may possess more than passing interest as indicating a tendency of the trade. At several of the meetings of the State associations jobbing interests were officially represented, their delegates participating in the discussions of the retail merchants. In some of the associations, indeed, the wholesale trade are represented in the membership. The opportunity to co-operate in this way in association work is a privilege which may obviously be extended to the manufacturers with as much propriety as to the jobbers, and there are some special reasons why this should be done. Nearly every Hardware merchant whose business is of any extent purchases a good proportion of his goods direct from the manufacturer, and the policy pursued by the manufacturer in regard to prices and the marketing of his goods has an immediate and important bearing on retail interests. The argument for the participation of the manufacturer in the councils of the retail associations is that in this way the advantages of conference are secured and the foundation is laid for intelligent co-operation in a much more hearty manner than if he were not allowed to participate in the meeting. While it is probably better as a general rule that neither jobbers nor manufacturers should be represented in the membership of the retail associations the Chicago merchants are to be congratulated on taking the initiative in efforts to establish close relations with the manufacturers and to secure complete harmony in the methods employed in the distribution of their products.

The indications are that the trade will not be held much longer in suspense as to the efforts to effect a consolidation of jobbing interests. It is generally understood that the options obtained on the various establishments are about to expire, and if anything is to be done it must be done quickly, unless, indeed, another renewal of the options is obtained. Those who are in close touch with the movement are of the opinion that its successful consummation in some form may be announced in the near future. The great question about which close secrecy is observed is the form and extent of the projected consolidation. It may be regarded as settled that it will not be on the broad and comprehensive lines, which by common report were originally contemplated. Such a project has been found to be utterly impracticable. As we have already pointed out, the coming together of a limited number of large houses is not impossible, and may be feasible and even advantageous, provided they can be taken over on a conservative basis and without any great allowance for good will. If, however, the enterprise—if it is to surprise the trade by its successful inauguration—is to be handicapped by fictitious valuations it will be found but poorly equipped for the competition which it will be called upon to face, notwithstanding the advantages, probably more imaginary than real, with which it is credited by its promoters.

Condition of Trade.

The trade is gradually recovering from the effects of the interruption of business caused by the recent severe weather, and especially the freshets, which interfered somewhat with the operation of mills and factories, already overtaxed to meet the demands of the

trade. There has, however, been a very satisfactory return to the volume of business, which is at least normal, and the production of goods which is going on in nearly all lines makes the record. The orders coming in to the manufacturers in all lines indicate a healthy condition of business throughout the country. The bulk of the orders from the large houses have already been placed, but some supplementary ones are being received, together with many from the smaller jobbers and larger retailers. The volume of new business is thus considerable, and with the orders in hand the manufacturers have enough in sight to keep them occupied for several months. In many lines the difficulty is to get goods. The scarcity of raw material is a troublesome matter, interfering with the output of the factories. The tone of the market is decidedly firm. A number of minor advances are reported, and in products which lie near the raw material the market is especially strong with an upward tendency. The reports in regard to building throughout the country are very encouraging and the indications point to an active demand for Hardware in these lines. The financial condition through the trade is eminently satisfactory and there is comparatively little complaint in regard to collections. The enterprise of the country continues to show itself in many ways and the prospect for a large business is excellent.

Chicago.

(By Telegraph.)

The volume of business is swelling with the advance of spring. The warm weather of the past week caused a sharp increase in the demand for all kinds of spring and summer goods. It seemed as if every dealer who had placed advance orders for delivery desired immediate shipment of what he had ordered. The rush of business was, therefore, so great that jobbers were compelled to work their force at night to endeavor to keep up. The change to colder weather is not believed to be of sufficient moment to check this business to any extent. The demand not only includes seasonable goods, but covers the general line of Hardware, and is noticeably strong for Mechanics' Tools and Hand Farming Implements and Gardening necessities. The movement of Wire Fencing is very heavy, and manufacturers are falling considerably in arrears in making shipments. Dealers are urgent for more prompt deliveries, as they fear a scarcity as the season advances. The demand for Heavy Hardware continues in excess of anything previously known. Advances are being made on sundry articles, and among them a 20 per cent. advance on Set and Cap Screws is noted.

St. Louis.

(By Telegraph.)

The volume of business in the Hardware market is again of large and substantial proportions, and the temporary lull in trade seems now to be entirely lost sight of. The favorable weather conditions and the abundance of moisture in the sections where most needed has been the main stimulus for the renewed activity. Shelf goods are in large demand, and with the passing of the severe weather building operations, which are now on a large scale, will be on the increase, and the requirements for Builders' Hardware will steadily grow larger. It is well to note that the demand includes largely such goods as Wire Screens, Screen Doors, Garden Tools, Ice Cream Freezers, &c. The call for Wire products of all descriptions is said to be especially large. Among the jobbers in Heavy Hardware the reports show a strong and active demand and inquiry.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—March business has been beyond the average. Weather has been very favorable and the demand for Hardware has responded satisfactorily. Just now the Northwest is having much the worst storm of the year and trade will doubtless drop off temporarily. Prospects for a steady spring business still continue good.

Boston.

BIGELOW & DOWSE COMPANY.—The seasonable weather gives a rush and go to business that are pleasing. Orders for spring shipments are being freely made, and a successful business is assured.

Last week a cloud hung over our business world, induced by a great strike of teamsters, freight handlers and allied interests. Happily, through the influence of the Governor, Mayor and business associations, the strike has been settled and the congestion at the railroad freight stations and the docks is being rapidly reduced to normal conditions.

A threatened strike of teamsters a month ago was prevented by an agreement made between the master teamsters and the men. All agreed to accept the conditions except one concern, who were protected by the police and the courts in employing nonunion men. To prevent this one concern from doing business a sympathetic strike was ordered and 20,000 men went out for five days. This concern still continue, the men have returned to their work with nothing gained and a loss of over \$200,000 in wages. It seems strange men will be so foolish in this age of progress.

The system of compulsory arbitration has been in successful operation in New Zealand and will soon be throughout Australia. Legislative action should control labor unions and fix upon them a legal responsibility for their acts and the damage they inflict upon the community at large.

Omaha

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—Reports of the condition of the jobbing trade in this section continue most favorable. There has been a marked and steady increase in the volume of business since January 1, each month showing a substantial gain over corresponding period of last year.

Not only is the present situation very gratifying in a business way, but the outlook is equally pleasing. Orders from the country cover well assorted lines of goods, showing that stocks in the hands of retailers are not equal to the demand, at the same time dealers are alive to the situation, and appear to have every confidence in the future. Traveling salesmen are elated over the rapid consumption of goods and the flattering aspect of affairs.

Prices are remarkably steady, with the prospect of some advances, owing to the scarcity of many lines of goods and dilatory shipments by manufacturers, who are crowded more than at any time in their history. While trade is exceedingly good it is not regarded as temporary, but it is expected that the pace will be sustained throughout the present year at least.

Cleveland.

THE W. BINGHAM COMPANY.—The Hardware trade in Cleveland is exceedingly good just at present, and customers are all clamoring for their spring goods. The month of February just past has given us an exceedingly large volume of business. Notwithstanding the snow storms and floods that visited different portions of the country, the demand for the general line of Hardware keeps up in good volume. It is astonishing the amount of Mechanics' Tools that are going out this time of the year.

Nails and Wire are in good demand. There is a large tonnage going from Cleveland, as it is one of the largest and best distributing points in the country, and we expect with the opening of lake navigation to add materially to our present prosperity.

Collections are very fair considering the time of year, when not much produce is moving in the country, and the merchants seem to have plenty of money to discount their bills. On the whole, business conditions in this section are very satisfactory.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade, which has suffered for a month or six weeks past owing to the severe weather, snow storms, rains and floods, which curtailed business very materially, is gradually reaching its normal condition. But it would be impossible to make

known the inconvenience caused salesmen in reaching their trade, shipments reaching customers, or unsatisfactory results in mail orders reaching the trade. Had this curtailment not occurred we think we would have passed through four or five weeks of the largest trade ever known. How much of it will be made up on orders that come in from now on can be made known by the future only. In the meantime trade is picking up very fast.

Louisville.

W. B. BELKNAP & Co.—A few days of seasonable weather has worked wonders toward drying up the roads and cheering up the spirits of the country store keepers. We are hoping now that the dull time is past, that we have "enjoyed" in about the same way that certain people enjoy poor health.

The railroads are busy; earnings seem to increase; there are a great many new projects for oil, mining and lumber companies in our State, and while the corporation biter has not altogether disappeared from the legislative field, yet he is not quite so prominent as heretofore. The recent decisions in Illinois have done a good deal toward settling matters in this part of the State and as far down as Texas, which was looked on as an anti-combination storm center. In Kentucky the double liability law has been repealed, so that investors in corporations, except banks and trust companies and institutions of that kind, are subjected only to the single liability. This is a great relief to the State, and we look for an infusion of new capital to result therefrom.

A valuable hand book of the State by counties has just been issued by the Commissioner of Agriculture, Labor and Statistics, Ion B. Nall, whose office is at Frankfort. Any libraries wishing this book for their shelves, or prospective investors, or those considering the question of immigrating thither, would do well to write to Mr. Nall for a copy of this book. It should be in every large library as a book of reference.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The beautiful spring weather that we are now enjoying has produced a very marked improvement in trade, and we are glad to say that the demand for Hardware in this section is now good. The mild weather has also the effect of improving the condition of the wheat crop very materially, and both farmers and retail merchants are in much better spirits than they were 30 days ago. While the extreme weather of January and February has made trade late, we think that before the spring trade is over we will have rounded up a good business, and as we now have a good prospect of a wheat crop, we have every reason to believe that trade will continue good.

Prices are being fairly well maintained.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—The transcontinental railroads have again put into effect home seekers' rates, that were so effective last spring in inducing immigration. Fifteen hundred people are reported as passing one gateway the first day, bound for Oregon and Washington. Many trains are run in three and four sections to accommodate the rush. This means business for the present and more for the future. We are in a complacent state of mind and losing no sleep as to what is in store for us.

Trade in all lines is satisfactory and collections good.

NOTES ON PRICES.

Wire Nails.—The mills which were most affected by the recent floods expect to begin shipping Wire Nails this week. It will take all the mills thus affected some time to catch up with the orders previously on their books. The majority of mills are behind on their orders, and shipments are further delayed by scarcity of cars. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.05
To jobbers in less than carload lots.....	2.10
To retailers in carload lots.....	2.10
To retailers in less than carload lots.....	2.20

These differentials are not always observed by outside mills.

New York.—The local demand for Wire Nails is not quite as large as was anticipated by jobbers. Stocks are broken in assortment to some extent, owing to delayed shipments from mill. The market is firm, and is represented by the following quotations: Small lots from store, \$2.25 to \$2.30; carloads on dock, \$2.18 to \$2.20.

Chicago, by Telegraph.—As had been expected, the demand for Wire Nails is growing heavier. The trade has not yet recovered from the interruption to the operation of factories in and around Pittsburgh caused by the flood. Jobbers report a very heavy trade. Prices have not been changed, single carload lots being held at \$2.20, and small lots at \$2.25 to \$2.30.

St. Louis, by Telegraph.—A heavy demand prevails in the market for Wire Nails and generally uniform and firm conditions govern prices. Small lots from store are quoted at \$2.30 to \$2.35.

Pittsburgh.—We note a continued heavy demand for Wire Nails, and shipments continue to be retarded by a scarcity of Steel, car shortage and the floods of several weeks ago, some of the mills not being in the best of running shape yet. The trade are placing liberal orders for Nails, and it is intimated that at another meeting of the Wire Nail mills, to be held the latter part of this month, there may be another advance in prices. The market is very firm and we quote Wire Nails at \$2.05 in carloads and \$2.10 in small lots, f.o.b. maker's mill.

Cut Nails.—There is difficulty in obtaining Cut Nails, especially Steel Nails, on account of the high price and scarcity of Steel. Some of the Cut Nails now on the market are made of scrap iron. Quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.00
Less than carload lots.....	2.05

New York.—Cut Nails are ordered in about the usual proportion to Wire Nails, in the local market. New York quotations for carloads and less than carload lots are as follows:

Carload lots on dock.....	\$2.13
Less than carload lots on dock.....	2.18
Small lots from store.....	2.25

Chicago, by Telegraph.—Jobbers continue to quote \$2.20 for small lots of Cut Nails from stock and report a moderate demand.

St. Louis, by Telegraph.—A moderate demand controls the market for Cut Nails, and small lots from store are quoted at \$2.35.

Pittsburgh.—A fair amount of business in Cut Nails is being placed, and there is trouble in getting prompt shipments of certain sizes. We quote Cut Nails at \$2. base, in carload lots and \$2.05 in less than carload lots, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination.

Barb Wire.—The demand for Barb Wire continues heavy, and indications point to a shortage later in the season. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
To jobbers in carload lots.....	\$2.60	\$2.90
To jobbers in less than carloads.....	2.65	2.95
To retailers in carload lots.....	2.70	3.00
To retailers in less than carloads.....	2.80	3.10

Chicago, by Telegraph.—Some classes of Barb Wire are now very scarce, as, for instance, Baker Wire. Ordinary Barb Fencing is in heavy demand, and manufacturers are falling behind on shipments. Jobbers report a larger movement, the demand for small lots being particularly urgent. Prices are unchanged at \$2.80 for Painted and \$3.10 for Galvanized in single carload lots, with 5 cents extra for small lots.

St. Louis, by Telegraph.—Barb Wire is in large demand, and quotations are firm. Jobbers quote in carload lots \$2.95 for Painted and \$3.25 for Galvanized.

Pittsburgh.—There is a large volume of business, and the output of the Barb Wire mills is shipped about as fast as made. For carloads we quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in

10 days: Painted, \$2.60; Galvanized, 2.90; less than carload lots, Painted, \$2.65; Galvanized, \$2.95.

Plain Wire.—Mills are running to their full capacity, but in some cases prompt deliveries of Plain Wire are difficult to obtain. The scarcity of steel and of cars is interfering somewhat with shipments. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.00	\$2.40
To jobbers in less than carload lots.....	2.05	2.45
To retailers in carload lots.....	2.05	2.45
To retailers in less than carload lots.....	2.15	2.60

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9.....	Base.....	\$0.40 extra.
10.....	\$0.05 advance over base.....	.40 "
11.....	.10 " " " " " " " " " " " "	.40 "
12 and 12½.....	.15 " " " " " " " " " " " "	.40 "
13.....	.25 " " " " " " " " " " " "	.40 "
14.....	.35 " " " " " " " " " " " "	.40 "
15.....	.45 " " " " " " " " " " " "	.75 "
16.....	.55 " " " " " " " " " " " "	.75 "
17.....	.70 " " " " " " " " " " " "	1.00 "
18.....	.85 " " " " " " " " " " " "	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—This branch of the trade keeps up well, manufacturers of Plain Wire having practically as much business as they can well handle. Jobbers report an increasing demand. Jobbers quote small lots from stock at \$2.20, base.

St. Louis, by Telegraph.—A good volume of trade is being executed in Plain Wire, and No. 9 is quoted at \$2.25 to \$2.30, and Galvanized at \$2.65 to \$2.70.

Pittsburgh.—The mills are having a heavy trade, and jobbers and small dealers are placing liberal orders right along. We quote Plain Wire at \$2, and Galvanized at \$2.40, in carloads, f.o.b. Pittsburgh, usual terms. For small lots advances on these prices are charged.

Griffin Mfg. Company.—Under date March 10 Griffin Mfg. Company, Erie, Pa., and 35 Warren street, New York, announce the following base discounts on Strap and T Hinges, which are subject to an additional discount of 20 per cent.:

Light Strap, No. 300.....	70 %
Heavy Strap, No. 400.....	75 and 10 %
Light T, No. 314.....	.66 2-3 %
Light T, No. 414.....	.60 and 5 %
Extra Heavy T, No. 514.....	.75 %
Hinge Hasps and Staples, No. 310.....	.55 %
Crate Hinges, No. 303.....	.70 %
Hasps and Staples, Nos. 500, 510, B 500.....	.85 %

Nuts.—An advance was made by the manufacturers on the 18th inst. in the prices of Cold Punched and Hot Pressed Nuts. Present published prices are as follows:

	Off list.
Cold Punched Plain Blank Square Nuts.....	4.70
Cold Punched Plain Blank Hexagon Nuts.....	4.90
C. T. & R. Blank Square Nuts.....	4.90
C. T. & R. Blank Hexagon Nuts.....	5.30
Cold Punched Plain Tapped Square Nuts.....	4.50
Cold Punched Plain Tapped Hexagon Nuts.....	4.70
C. T. & R. Tapped Square Nuts.....	4.70
C. T. & R. Tapped Hexagon Nuts.....	5.10
Hot Pressed Nuts, Square Blank.....	5.00
Hot Pressed Nuts, Hexagon Blank.....	5.30
Hot Pressed Nuts, Square Tapped.....	4.80
Hot Pressed Nuts, Hexagon Tapped.....	5.10

This advance has been made on account of the advance in the price of Iron. They are also full of orders.

Egg Beaters.—The manufacturers of Dover Egg Beaters, who are working together with a good degree of harmony, have made another advance in prices.

Shovels and Spades.—The trade generally were surprised last week by the announcement of an advance of \$1.50 in the list price on the regular list of Shovels and Spades, which are subject to the small trade to a discount of 40 per cent. This makes the net advance to this class of buyers 90 cents per dozen. The list of the Maynard pattern goods and of the Bear brand was advanced 50 cents. This advance was determined upon to go into effect April 1. The increased cost of manufacture, both in labor and raw material, coupled as it is with a heavy

demand, are the reasons for these higher prices. The terms, discounts to various classes of buyers, rebates, &c., remain unchanged. The action of the manufacturers has had the effect of stimulating orders so as to get the advantage of present prices. Many of the manufacturers are filled up with orders and several of them find difficulty in making shipments as promptly as their customers desire. Outside competition continues to develop, but it is not as yet very troublesome to the associated manufacturers.

Pumps.—There is a good deal of unevenness in the market for Pumps, and low prices are current on Pitcher Spouts. There is, however, an excellent demand, and several of the manufacturers are considerably behind their orders.

Stove Boards.—The prices which are ruling for Stove Boards are somewhat higher than were current a year ago. The volume of business which is being booked by the manufacturers is large, and the indications are that the supply will be fully taken up by the trade.

Set and Cap Screws, &c.—This line of goods is characterized by a firm tone, and the recently advanced prices are well maintained. The large business which the manufacturers are doing indicates the activity which prevails throughout the trade.

Binder Twine.—The demand for Binder Twine in the Eastern market is not heavy. It is presumed that buyers in this territory will defer purchasing until the nearer approach of harvest. Expression is given to the belief that the present price of Twine is attributable to the willingness of Binder manufacturers to buy all the fiber offered at the high prices ruling, and that as long as they continue to do this there is no probability of prices of Twine being lower. This view may not, however, hold good near the end of the season, when the harvest reaches the Northwest. Quotations are as follows, f.o.b. New York, with $\frac{1}{4}$ cent per pound rebate in carload lots:

	Per pound.
Sisal	10 $\frac{1}{2}$ c.
Standard	10 $\frac{1}{2}$ c.
Manila	13 $\frac{1}{4}$ c.
Pure Manila.....	14 $\frac{1}{4}$ c.

Some manufacturers are guaranteeing prices to May 1, date of shipment.

Cordage.—No change has taken place in the Rope market during the week. Demand is fair for Sisal and Jute Rope, but only moderate for Manila Rope, owing to its cost. Yarn Jute Rope is a little easier, and is quoted at 4 $\frac{1}{2}$ cents per pound for $\frac{1}{4}$ -inch and up, in small lots. Sisal Rope is quoted on the basis of 7-16-inch and larger from 9 $\frac{1}{2}$ to 10 cents per pound, and Manila Rope, on the same basis, at 13 $\frac{1}{2}$ cents, with a rebate of $\frac{1}{4}$ cent per pound in larger quantities.

Glass.—At a meeting of the Eastern section of the National Jobbers' Association, held on March 18, the price of small lots of single and double strength from store was advanced from 90 and 10 to 90 and 5 per cent. discount. It is understood that the combined Window Glass factories are contemplating a general advance in wages, as a retaliatory measure against factories outside the combine. It is assumed that the latter will be obliged to meet the advance, which is expected to prove burdensome to factories who have sold Glass for forward delivery at low prices. The advance in wages will probably be made the grounds for an advance in prices to the Jobbers' Association, which has been promised by the combined factories, when the jobbers place their spring order for Glass. Demand is light. The following are the quotations of the Jobbers' Association:

	Discount.
From store.....	90 and 5 %
F.o.b. factory, carload lots:	
Single strength.....	90 and 10 and 7 $\frac{1}{2}$ %
Double strength.....	90 and 10 and 10 %

Paints and Colors.—**Leads.**—There has been an improvement in the demand for White Lead in Oil, during the week, for immediate and April delivery. Quotations are as follows: In lots of 500 pounds and over, 6 cents per pound; in lots of less than 500 pounds, 6 $\frac{1}{2}$ cents per pound.

Oils.—**Linseed Oil.**—Owing to a slight show of weakness in Linseed Oil prices considerable Oil was sold during the closing days of last week for prompt and nearby delivery, at a shade under quoted prices. It is understood that most of this Oil was purchased for immediate consumption and not for selling. The tone of the market is again firm, at the following quotations, according to quantity: City Raw, 63 to 64 cents; out of town Raw, 62 to 63 cents per barrel.

Spirits Turpentine.—Owing to light receipts of Turpentine at Southern points and severe weather in the Turpentine districts prices have advanced at this point. Under these conditions demand is light. Quotations, according to quantity, are as follows: Southern, 48 to 48 $\frac{1}{2}$ cents; machine made barrels, 48 $\frac{1}{2}$ to 49 cents per gallon.

THE RELATIONS OF RETAIL MERCHANTS AND MANUFACTURERS.

At a recent meeting of the Chicago Retail Hardware Dealers' Association the name of W. H. Bennett, Chicago manager for the Reading Hardware Company, was proposed for honorary membership and he was unanimously elected. The committee appointed to notify Mr. Bennett of his election consisted of William T. Gormley, Frank F. Porter, D. McLaughlin and J. L. Smith. On Tuesday afternoon, the 11th inst., this committee called on Mr. Bennett at his office, and Mr. Gormley, the chairman of the committee, made an interesting address of notification, dwelling on the fact that Mr. Bennett had from the organization of the association taken a deep interest in all its proceedings and had on several occasions demonstrated his loyalty to the association and its work. Mr. Bennett responded, expressing his extreme gratification at the honor conferred, and promised his earnest support in all the objects of the association. The election of Mr. Bennett may prove to be the opening wedge in association affairs which may tend to bring the retailer closer to the manufacturer.

CALIFORNIA STATE RETAIL HARDWARE ASSOCIATION.

The first annual meeting of the California State Retail Hardware Association was held in San Francisco on March 10 and 11. Delegates representing the five local associations of the State were present. Mayor Schmitz of San Francisco welcomed the dealers to that city. The following officers were elected for the ensuing year: President, O. F. Sites, San Francisco; vice-president, A. F. Gutman, Germantown; secretary, Henry Gracey, San Francisco; treasurer, H. C. Bennett, San Francisco. Executive Committee: C. W. Bennett, Fresno; Mr. Turner, Modesto; E. A. Eaton, Salinas; J. W. Baxter, Watsonville; W. L. Lutz, Santa Ana; E. C. Dawe, Santa Barbara; John C. White, Marysville; A. L. Nichols, Chico; S. Armstrong, San Francisco, and M. Brown, San Francisco.

The State organization comprises the following associations: The San Francisco and Oakland Retail Hardware Dealers' Association, the Pacific Retail Hardware Dealers' Association, the Central Retail Hardware Dealers' Association and the Southern Implement and Hardware Dealers' Association.

On the second day of the session conferences were held with the Pacific Coast Hardware and Metal Association, the jobbers' organization. The results have not been made public, but it is given out that arrangements were made by which the friction between the retailers and the jobbers will be largely removed.

TASMANIA SAWING CONTESTS.

SIMONDS MFG. COMPANY, Fitchburg, Mass., advise us that at the annual meeting of the Australasian Axemen's Association, held at Burnie, Tasmania, in November last, there were three sawing contests, in all of which the Simonds Crescent Ground Crosscut Saws took the honors. The three events were single handed, single handed handicap and double handed handicap.

NEW ENGLAND HARDWARE DEALERS' ASSOCIATION.

THE regular monthly meeting of the New England Hardware Dealers' Association was held at the Quincy House, Boston, Wednesday, March 12. President S. D. Balkam presided. After the usual dinner the business meeting was held and A. M. Mackenzie, Roxbury, was elected to membership. The present administration is disposed to make efforts to increase the membership of the association, and the best method of accomplishing this purpose was discussed, but a conclusion was not reached.

For the purpose of comparison and to bring about, if possible, greater uniformity in the selling price of staple articles, President Balkam sent out with the notice for this meeting a slip on which members were invited to give their selling price on eleven articles upon which there is commonly some variance. These were handed in at this meeting and a comparison made, which showed perhaps a trifle more uniformity than when this experiment was tried some time before.

The president appointed as an Entertainment Committee for the April meeting Calvin M. Nichols and Henry M. Sanders, and on motion of D. Fletcher Barber notice was given that a change in Article 12 of the By-laws would be asked for at the next meeting.

The principal speaker of the evening was Hon. Willard Howland of Chelsea, who entertained the association for nearly an hour upon the subject of "The Duty of Business Men to the State," after which the meeting adjourned.

COLUMBIAN ENAMELING & STAMPING COMPANY'S NEW PLANT.

THE COLUMBIAN ENAMELING & STAMPING CO., Terre Haute, Ind., is the name of an organization recently formed to carry on a manufacturing business in high grade Enameled Kitchen and House Furnishing Goods. It is really an outgrowth of what until December 31, 1900, was the Bellaire Stamping Company, Harvey, Ill., an old established business, whose plant on the date named was destroyed by fire. They are prepared to resume business where the old company left off and will place in the market again all of the goods made under the Bellaire Company's patents and registered trade-marks. They have the former expert employees of the Bellaire Stamping Company, and expect to have the factory in operation the latter part of March, 1902. The company now have their full equipment of machinery, tools &c. They also have in place, ready to connect, the boilers, engines and generators. They expect to operate their plant wholly by electricity and have installed two units of 450 horse-power each. The capacity of the steam plant is 600 horse-power. The only work now remaining to complete the plant and have it ready for operation is the steam fitting, which is going on rapidly. The warehouse is 64 x 196 feet, four stories high, and is of slow burning or mill construction, equipped with automatic sprinklers. The stamping department is a one-story fire proof building, 140 x 260 feet. The enameling department is a one-story fire proof building, 260 x 285 feet. The power plant is inclosed by a fire proof building, all of these fire proof buildings being of brick, steel and tile construction. There are three switches connecting with the various departments of the business. The switches connect directly with the Big Four, Chicago & Eastern Illinois and the Vandalla-Pennsylvania lines.

FORD HARDWARE COMPANY, wholesale and retail dealers in Hardware, Farm Implements, Stoves, Buggies, Blacksmiths' Supplies, &c., Washington C. H., Ohio, advise us that there has been no change in their style since they began business two years ago. From time to time they receive from manufacturers and jobbers communications addressing them under other styles, which they fail to understand, as the business has been conducted under the same name from the first.

SPORTING GOODS IN THE HARDWARE STORE.

THAT Sporting Goods are a line which have a natural place in a hardware store has long been recognized by enterprising merchants, but during recent years the number of hardware dealers handling this line has largely increased. It is generally agreed that their experience in the sale of these goods has been a satisfactory one, most of the items yielding a good profit. The assortment of Sporting and Athletic Goods carried by most stores is expanding from year to year, and this is well shown in the comprehensive catalogues issued by the large jobbing houses devoted exclusively to this department of their business. Among the latest catalogues of this sort which we have received is one from the Supplee Hardware Company, Philadelphia, who, in 112 large pages, present an extensive line of Guns, Rifles, Revolvers, Ammunition, Hunters' Clothing, Tennis, Gymnasium and Base Ball Goods, Croquet Goods, Bicycles, &c.

Another catalogue comes from the Hockaday Hardware Company, Wichita, Kan., who occupy nearly 100 pages in presenting to their customers their line of Bicycles and Sundries, Base Ball Goods, Golf Supplies, Croquet Sets, Fishing Tackle, Hammocks, &c. This company are a comparatively new jobbing concern, having opened up in Wichita three years ago. They have, however, had a gratifying growth, and are now traveling eight men, with a capital stock increased to \$200,000 paid up. The company advise us that they are now comfortably settled in their new building, which is much larger than their former quarters, which they had outgrown.

PENNSYLVANIA RETAIL HARDWARE DEALERS' ASSOCIATION.

UNDER date of March 12 the following circular relating to the meeting next week of the Pennsylvania Retail Hardware Dealers' Association has been issued:

The Pennsylvania Retail Hardware Dealers' Association will meet at the Monongahela House, Pittsburgh, March 26 and 27.

You are cordially invited to attend these meetings, and if you are not already a member we hope that it is not because you think such organizations are unnecessary.

The truth must be forced upon us that there is only one force mighty enough to cope with the powerful influences that are operating to undo us, and that is the combined forces of the retail dealers of the country.

It is useless for the few to make their protests against these evils. We must plan, as great conquests are planned, and unite, as by co-operation only great victories are achieved.

We need your help. Will you be present at these meetings?

Please reply promptly on the inclosed postal card, as the Committee on Entertainment desires to complete its work.

J. F. FRYE, Secretary.

J. E. DEGBY, H. F. ROBINSON, G. F. RUDOLPH, Programme Committee.

This circular is being sent to all retail Hardware merchants in the State whose names the association have been able to secure. If any are missed it is not by design, as the officers desire, if it were possible, to have every Hardware retailer in the State at the meeting, or at any rate, a member of the association. Arrangements have been completed by which it is expected a very interesting and profitable meeting will result, with, it is hoped, a large accession to the membership. Any further information desired in regard to the gathering may be obtained from the secretary, J. F. Frye, Charleroi, Pa.

THE YOUNG HARDWARE COMPANY is the style of a new house starting up at Zanesville, Ohio, to do an exclusive hardware jobbing business. Their paid-up capital is \$50,000, which will be increased, if necessary. The officers of the company are M. Young, president; W. B. Cosgrave, vice-president and treasurer, and G. Yarnell, secretary. They have leased a building on Third street near Union Depot, 133 x 33 feet, with four stories and basement, and are now getting in their stock and expect to be ready for business by April 1. Mr. Young, the president of the company, has been in Pittsburgh and New York during the past week placing stock orders.

WARNER & HAVILAND.

WARNER & HAVILAND is the new title of what formerly was Warner & Rucker, 88 Chambers street, New York. This concern are manufacturers' agents and represent a number of well-known interests in what is sometimes referred to as the metropolitan district, embracing a radius of from 50 to 75 miles around New York. The new partner, John E. Haviland, has been with the Russell & Erwin Mfg. Company for 17 years and was for a long period one of their city salesmen, Mr. Warner also having been long in the same company's employ. They represent the Rogers Screw Company, Providence, R. I., and are carrying in stock complete assortments of their Flat Head Bright, Flat Head and Round Head Brass and Round Head Blued Screws; Romer & Co., Newark, N. J., Padlocks and Night Latches; Braunsdorf-Mueller Company, Elizabeth, N. J., Mechanics' Tools; Brohard & Co., Philadelphia, Pa., Door Holders and Expansion Bolts; Thomas Devlin & Co., Philadelphia, Pa., Carriage, Saddlery, Trunk and Awning Hardware, &c.; McCaffrey File Company, Philadelphia, Pa., Files and Rasps; Philadelphia Hardware & Malleable Iron Works, Philadelphia, Pa., Registers and Ventilators; Holland Mfg. Company, Baltimore, Md., Tacks, Staples and Glazier Points; Baltimore Hinge Company, Baltimore, Md., Hinges, Butts, Brackets, &c., and Clendenin Bros., Baltimore, Md., Copper Rivets and Sheets, Wire Nails and Brads, Copper Nails and Tacks, &c.

C. SIDNEY SHEPARD & CO.'S FIRE.

ON the night of March 6 a fire almost completely destroyed the stock of C. Sidney Shepard & Co., Chicago, with a loss of not less than \$100,000. A temporary office has been opened on the second floor of 21 Randolph street, and all orders for the Chicago trade will be promptly filled from the Company's St. Louis house. They expect to return to the building formerly occupied by them as soon as the owners can rebuild it, and efforts are being made to have it ready by the latter part of April. Owing to the ample resources of the house it is improbable that their customers will experience any annoyance by reason of the fire, and orders placed with them will be filled with the same high class goods and promptness that have made the concern popular with the trade.

AERMOTOR COMPANY'S CATALOGUE.

J. H. EDWARDS, 59 Park Place, New York, is the representative in this territory of the Aermotor Company, Chicago, who, in an attractive and instructive way, describe the various features of their business in an illustrated catalogue of 40 pages. Aside from the numerous Wind Mills and Pumps shown an important feature of the business is Tanks in which to store pumped water. These Tanks are made of pine and cypress in the best manner. They also make Galvanized Steel Storage Tanks, which are somewhat higher in price but more durable.

Buck Bros., who are dealers in Hardware, Stoves, &c. Middletown, N. Y., have issued a special catalogue devoted to the line of Farming Implements which they carry. It comprises 32 pages and is attractively printed. The motto of the firm, "It Pays to Buy the Best," is given prominence on the front cover. The house advise us that their business in Agricultural Implements has increased to such an extent that they are obliged to add 5000 square feet of warehouse room for its accommodation. Last season they handled 11 carloads of McCormick goods alone, and also did a large business in the county on Feed and Ensilage Cutters. They have increased their stock of Implements, &c., so that now they have, they believe, the largest stock in the county of Implements, general Hardware, Stoves and Ranges.

S. NORVELL of the Norvell-Shapleigh Hardware Company of St. Louis, Mo., has just returned from a three weeks' sojourn at Palm Beach, Florida.

PRICE-LISTS, CIRCULARS, &c.

E. G. SMITH, Columbia, Pa.: Catalogue of the Columbia Calipers, Nos. 1, 3, 5 and 15; Columbia Vernier Calipers, Nos. 9, 10, 35, 40 and 45; Columbia Spherometers, Columbia Screw Micrometers, Columbia 6-inch Steel Rule, graded into millimeters on one side and hundredths of 1 inch on the other, and Which Way Pocket Level. A copy of the catalogue will be mailed to any one on application.

THE GEO. DELKER COMPANY, Henderson, Ky.: Catalogue showing their line of Buggies, Phaetons, Surreys, Delivery Wagons, &c.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio: Catalogue of their extensive line of Twist Drills, Reamers, Taps, Cutters, &c. Several additions to the company's line are shown. In addition to the regular alphabetical index there is an index by list numbers. The catalogue also contains a number of tables and miscellaneous information. The company advise us that they are constantly improving their plant, both in the way of additions and equipment.

THE NATIONAL SAW COMPANY, Newark, N. J.: Catalogue and price-list, 100 pages, showing the line of Saws manufactured at their different plants at Newark, Middletown, N. Y.; Brooklyn, N. Y., and Cincinnati, Ohio. In the extensive line are shown Hand, Panel and Rip Saws, Back, Compass and Butcher Saws, Pruning, Plumbers' and Ship Carpenters' Saws, Turning, Felloe, Butcher and Billet Webs, Circular Mill and Mulay Saws, Gang, Drag and Pit Saws, Cross Cut Saws, Band Saws, Plastering and Brick Trowels, Saw Mandrels, Swages, Slaw Cutters, &c.

AMES SWORD COMPANY, Chicopee, Mass.: Illustrated catalogue and price-list showing small Padlocks for dogs and cats, Perfection Key Holders, Trusty Key Holder, Key Guard Chain, Perfection Padlocks, Baggage Protector, Bicycle Padlock, Cast Bronze Padlocks and Padlock Keys. A separate circular calls attention to their Endless Silk Sewed Strapping Belts.

GASOLINE LIGHTING SYSTEM.

THE INCANDESCENT LIGHT & STOVE COMPANY, Cincinnati, Ohio, issue a booklet, entitled "Why are Gasoline Lighting Systems Persecuted by the Underwriters' Laboratory and the Committee on Fire Protection Engineering?" in which they point out that gasoline lighting systems, and especially their F-P. Lighting System, are not more hazardous and are in many respects safer than gasoline devices which are permitted by insurance boards. The company challenge any one to show where a single accident has been caused from any source with 2000 Incandescent Gas Machines built by them six years ago, and 4000 F-P. Machines with safety escape pipe connected to the governor, which they have put out since March 1 of last year, all of which are said to embody the so-called hazardous features.

DETROIT LEATHER SPECIALTY COMPANY'S NEW CATALOGUE.

THE DETROIT LEATHER SPECIALTY COMPANY, Detroit, Mich., have just issued a finely printed, illustrated descriptive catalogue of what they call the "Wear Well" Leather Packings. These Packings are designed particularly for various kinds of hydraulic construction, and they undertake to follow a customer's specifications, giving, it is stated, perfectly formed Packings that fit and stand the Government test of 5000 pounds. In Cup Leather Packings they can furnish from 1 to 36 inches diameter inclusive, any sized center hole, and cupped to a depth of 3 inches.

The Fairfax-Roberts Hardware Company have just commenced business in the Wood Building, Bristol, Tenn. They intend doing both a jobbing and retail trade. The active partners are G. P. Fairfax, formerly of Fairfax Bros., Roanoke, Va., and Harry H. Roberts, who was bookkeeper with the same house. E. L. Bell, formerly of the B. B. & J. Hardware Company, Lynchburg, Va., is special partner.

NOTES ON FOREIGN TRADE.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,
NOBPOLE ST., LONDON, W. C.

The Hardware Trade.

THERE is still a feeling of cheerfulness in the Hardware trade, which is due, I think, to the stiffening of prices and a general conviction that if the American market is busy there is no reason why the British should not be also. War Office orders are still coming in, particularly one for 11,000 Saddles. Ammunition manufacturers have booked some important orders, which, it is said, will keep them busy for several months to come, but no orders are expected for some time for any more small arms until the new type of service arm is finally decided upon. The brass trades are quiet, Lamp and Chandelier makers finding their orders particularly restricted, both for the home and export trade. On the other hand the electric light branch is busy. The Metallic Bedstead trade is in a poor way, but during the past week or two has shown some signs of improvement. Complaints are bitter that this trade has lapsed into the old senseless competitive era. Perhaps when the Metallic Bedstead manufacturers realize all they have lost by the break up of their association they may attempt another association, although doubtless with certain modifications. One well-known firm of Bedstead manufacturers have had to call together their principal creditors. Vehicular iron work is in good demand, such as Springs and Axles and Carriage Lamps. On overseas account the trade with South Africa still improves, but the trade with China, Japan and Eastern countries generally still continues sluggish, with the exception of India, which is buying a fair amount of goods. The demand for Agricultural, Mining and Steam and Manual Pumps is brisk. I have several times referred to the fact that enameled plate signs are in great demand, and there seems every likelihood of this trade expanding indefinitely, as advertising with enameled plate signs is becoming very popular. I again suggest that this is a line which Americans should inquire into. The Japanese, too, are busy. Best Locks are still the rage, makers of medium and lower qualities finding but little to do. The Builders' Ironmongery trade is, like the curate's egg, good in parts. Thus, in Birmingham those engaged in this industry are busy, while upon the other hand in Sheffield they are slack, particularly in the Stove Grate trade. Considerable cutting is taking place here, and reduction in price is the order of the day. The building trade in Yorkshire is in a bad way, and of course seriously affects Builders' Ironmongery.

The Trade in India.

As I have stated above, orders from India come in in fair quantities. It seldom occurs that a famine is universal, so that often trade in one Presidency is good when trade in another is badly depressed, on account of the famine, or the cotton crop, or the tea crop, as the case may be. At a recent meeting of the Society of Arts a young Indian graduate of an English university read a paper in which he dealt with native industrial skill. He said Indian artisans are more skillful, more subtle in their manipulation, more sober in their habits, more steady and manageable than any in the world. A blacksmith at Malvan in Ratnagari made Razors and Knives which could not be distinguished from the best from Sheffield. Give a model of any sort to the silversmiths of Kutch and they produce the duplicate without difficulty. But what the natives lack is the faculty of co-operation and organizing, the power of managing, of attention to details, financing and pushing their goods in the markets of the world. He suggested industrial co-operation with Government subsidies as a panacea for Indian poverty. I mention this as another sign of the industrial renaissance of India. Meanwhile, India can buy in big quantities. For example, at the present time the Corporation of Calcutta is calling for tenders for Stop Cocks as follows: 1428 1-inch, 2856 $\frac{3}{4}$ -inch, 5716 $\frac{1}{2}$ -inch, to be delivered c.i.f. Calcutta. The Stop Cocks are to be of strong pattern gun metal, with loose valve,

square head of spindle, and a false spindle not less than $\frac{3}{8}$ inch square on all sizes. Stops to have male ends threaded for Iron Pipes. A pattern of each size is to be sent with each tender, and when the tender is accepted subsequent deliveries must be equal to the pattern, or the Stops will be rejected. All Stop Cocks must be tested by the makers up to 500 feet headwater. They should be delivered in equal monthly installments, and tenderers should state the number of each size they are prepared to deliver monthly and when the first installment can be delivered. Tenders, indorsed "Tender for Stop Cocks," should be addressed to the Vice Chairman, Municipal Offices, by April 23.

Another Exhibition.

The Austro-Hungarian Consul-General in London states that the Society of the Blue Cross in Vienna intend to hold an exhibition in that city between March 15 and April 20 next, to be known as the "Ausstellung der Hausfrau," which I take to be a domestic management exhibition. As American makers have made a specialty of little household contrivances, I trust they have managed to be well represented at this exhibition, although, of course, if they have not heard about it before, it is now too late. It should be particularly remembered that a large volume of trade is now done in Europe, and particularly in the Southeast and East, by means of exhibitions. The novelty of exhibitions has, to some extent, worn off in the more Western countries, but they are still great events in the near East.

The Trade with Cuba.

The following resolutions have been passed by the Council of the Liverpool Chamber of Commerce:

1. That this Council, having heard the statements made by Liverpool firms interested in trade with Cuba, are of opinion that prompt action should be taken by this Chamber and others to protect British commercial interests in connection with that island, which are threatened, and they direct that other Chambers of Commerce specially concerned, including those of Manchester, Birmingham and Belfast, should be asked for their active co-operation and to interest their representatives in Parliament in the subject, with a view to bringing the matter strongly to the notice of His Majesty's Government.

2. That His Majesty's principal Secretary of State be furnished with a copy of the foregoing resolution and asked to receive a joint deputation from this and other Chambers next week on the subject.

3. That the principal Chambers of Commerce of the United Kingdom be furnished with a copy of the letter addressed by this Chamber to the Foreign Office on the 17th of February, together with a copy of this resolution, and informed that the Marquis of Lansdowne has been asked to receive a joint deputation on the subject between Tuesday and Thursday of next week (the period of meeting of the Association of Chambers of the United Kingdom); and, further, that the same Chambers be urged to communicate with the members of Parliament for their respective divisions and invite their attendance and active support.

The matter is of some concern, doubtless, to Liverpool exporters, but it seems to me to be a storm in a teacup.

The Trade of Vladivostok.

It may not be known to your readers that the Vladivostok Custom House commenced its functions on January 1, 1901. Some alterations have been made from time to time in the import duties of goods coming into this port, but there is clearly some urgent demand for various metal goods, as the following can be imported free of duty: Steel, Steel and Iron Needles, Steel, Iron and Tin Plate articles, Iron and Steel Scales (except the finely balanced kinds used by chemists), Iron and Steel Machinery, Iron and Wire Nails, Iron and Steel Scythes, Iron in bars, Sheet Iron, Tin Plate, Cast Iron, Rivets, Tools, Wheels, Locks, Tables, Sewing Machines, Furniture, Glass and Glass Ware, Asphalt, Bicycles, Leather Straps, Driving Belts.

The Wolverhampton Exhibition.

I am afraid American exporters have lost a good chance in not taking out more space in the Wolverhampton Exhibition, which promises to be one of the successes of this year. All the space has been taken up, the ex-

hibition is to be opened in great form by one of the royal family, and altogether success seems assured. I understand that a number of Americans are coming over here for the coronation. Those engaged in the Hardware and metal trades should make it a point to go to Wolverhampton, for they will get an excellent bird's-eye view of the present standing of the English metal industries.

A New Development from Berlin.

It is stated that an important departure is about to be made by the German Foreign Office in conjunction with the Ministry of Commerce. A sum is to be set aside for the purpose of enabling consuls in the various parts of the world to telegraph to Berlin anything of importance to commercial and industrial firms. This is said to be merely an indication of the tendency manifest in German official quarters to make the German consul a speedy correspondent to act in the interests of German commerce.

Duties on Goods for the Transvaal.

The Natal *Mercury* of January 10 states that it has been notified that on and after February 1, as regards goods destined for Pretoria and Johannesburg, Transvaal customs duties will not be collected in Natal, but will be payable at the place of destination to the proper officers of the Transvaal customs stationed there. Therefore, as regards Pretoria and Johannesburg (and those places only for the present), Transvaal customs entries will not be accepted by the Natal customs. Goods will, however, still be refused by the railway department unless the railway consignment note has been indorsed by the Natal customs with the usual stamp and signature. In the case of goods from bonded warehouses, or when dutiable from ship's side, the railway consignment note will be stamped and signed on production of the Natal transit entry. In the case of goods from open stocks or of colonial goods, or of goods free from Customs Union duties, one entry only is to be passed, and, on production of this entry, containing all particulars of export, the railway consignment note will be stamped and signed. The usual permits to import into the Transvaal must, however, still be obtained and produced. This notice only applies to Pretoria and Johannesburg. Goods for other stations and places must be cleared in Natal, as hitherto.

The New Zealand Trade.

A trade dispatch states that the Hardware trades in Wellington and other parts of New Zealand are fairly active, building operations in course of progress being of considerable volume. The outlook of business in the near future is, however, discounted by the abnormally low price of wool, which must curtail the spending power of the people in many ways.

The Trade of Egypt.

The report of the Egyptian customs administration on the Egyptian trade for last year is just out, the figures quoted being on the basis of English pounds. From this I see that the declared value of the imports for last year amounted to £15,244,000, an increase of £1,132,000 as compared with 1900. The exports, however, show a decrease, standing at £15,730,000, or £1,036,000 less than in 1900. The decline in the aggregate value of the exports was due to the fall in the value of raw cotton, the total value under this head for last year being £11,833,000, or £1,205,000 less than in 1900. The imports from Great Britain amounted to £5,568,000, an increase on 1900. From America goods to the value of £315,000 were received, compared with £289,000 on the year before. It will thus be seen that Egypt is at the present time doing a very large trade, but the proportion of this done by America is very small. I see no reason why it should not be materially improved.

Odessa.

News from Russia percolates to the outside world slowly. Thus, I have only just received a report of the trade of Odessa for the year 1900. The principal points regarding the trade of Odessa for that year are, a, a diminished export, owing to the continued bad harvest in the neighborhood; b, scarcity of money, which partly

resulted from overspeculation and losses in unsound manufacturing concerns, and partly from there being no crops to sell. So far as trade is concerned the United States practically monopolizes the supply of Harvesters, Binders, Mowers, Reapers and Horse Rakes. Steam Threshers are supplied by British manufacturers, but German firms are following British models and are gaining a footing in the market by giving longer credit and selling more cheaply. Single and Double Plows, Drills and Broadcast Seeders, Hand and Horse Power Threshing Machines are made in Russia and to some extent imported from Germany. Scythes and Sickles are bought from Austria.

AUSTRALIAN NOTES.

FROM OUR SPECIAL CORRESPONDENT.

GENERAL ironmongery business, in common with other trades here, has been, for this season of the year, unusually dull. The depression is but temporary, and is due to a variety of causes. The promises of the earlier season with regard to the harvest prospects have not materialized, the clerk of the weather in this part of the world being of a peculiarly fractious disposition. The harvest, dairy products and meat supplies are not up to the usual standard, and consumption must necessarily suffer in sympathy.

The delay in the final settlement of the Australian tariff is not without its demoralizing effect, the iron and Hardware lines proving particularly difficult items for our legislators.

The depression in the mining industry, the prosperity of which is so absolutely essential to Australia, is also a big check, especially on country trade.

With the cabled advice of the rise in American Australian freights will no doubt come increased cost of all finished iron. In the absence of knowledge of the factors at work to necessitate the said increase, this only appears as a strong help to German competition.

The New Tariff.

Tariff uncertainties still continue to exist. The Federal House has not yet finished its labors in committee, after which the tariff will have to go before the Federal Senate, who will probably suggest further amendments. Then these will have to be agreed to both by Lower House and Senate, so that on present indications two months more must lapse before we can actually know "where we are."

The following alterations in Hardware lines have been agreed to in the House of Representatives (the Lower House) since last advice:

	Government proposal. Per cent.	Duty agreed to. Per cent.
Manufactures of metal (not elsewhere included), ad valorem.....	25	20
Rolled Iron or Steel Beams, Channels, Joists, Girders, Columns, Trough and Bridge Iron or Steel (not drilled or further manufactured), ad valorem.....	20	15
Shafting (cold rolled, turned or polished), ad valorem.....	20	15
Bolts and Nuts.....	20	15
Engines, ad valorem.....	25	20
Bollers, ad valorem.....	25	20
Pumps, ad valorem.....	25	20
Machines and Machinery, ad valorem.....	25	20
Screws, ad valorem.....	25	20
Axles, ad valorem.....	25	Free
Springs, ad valorem.....	25	15
Mixed Metal Ware, ad valorem.....	25	15
Plated Metal Ware and Plated Cutlery, ad valorem.....	25	15
	25	20

The above concessions have been made to gratify the free trade party. The reductions will mean little difference in the year's work.

Several of the lines are imported to some extent from America, although not to so great an extent as is desirable.

TARIFF EXEMPTIONS.—The following Hardware lines have been added to the exempt list since last advice: Iron Making Machine Tools: Bolt making, fining and cropping.

Photo Engravers' Tools: Rotary Planing Machines.

Rotary Edging Machines, Routing Machines, Rotary Bevelers, Engravers' Tools of trade.

Cadet Rifles.

Turbines, water and steam.

Engine Lathes, Turret Lathes, Drilling, Slotting, Punching, Shaping, Sawing, Grinding, Milling, Key-seating, Nut Furnishing, Tapping, Screwing, Planing, Tooth Wheel or Gear Cutting, Forging, Nut Making, Centering Chucks for Lathes; Blowers used for foundry or mining purposes, Pneumatic Hammers, Steam Hammers, Milling Machine Cutters.

Wood Working Machine Tools—namely, Sawing, Joining, Planing, Molding, Surfacing, Tenoning, Tonguing and Grooving, Trying-up, Sandpapering, Dovetailing, Mortising, Boring, Saw Sharpening, Rounding, Saw Brazing, Spoke Making, Wheel Making and Copying Lathes.

Carriage Bolts, $\frac{3}{8}$ inch and under in diameter, and 4 inches and under in length.

Maize Crushers, Huskers, Maize Harvesters and Binders.

Cane Knives.

Automatic Can Making and Closing Machines for use in packing and preserving meat, fruit, fish, butter and vegetables.

Patent Band Saw Mills; Cold Tire Setting Machines, Miners' Picks and Metal Bound Pick Handles.

Engine Lathes; Zinc Refining Retorts, and Aluminum Rotary Graining Machines.

Crucibles, all free.

RECENT TARIFF DECISIONS affecting American imports are as follows:

Fire clay manufactures, n.e.i., such as Scorifiers, Muffles, &c., 15 per cent.

Tin Plates (painted), 25 per cent., as manufactures of metal, n.e.i.

Steel Wool.

Steel Wool is being inquired for as a substitute for Sandpaper. This American production has not yet found its way out here.

Wire Netting

A 10 per cent. duty has been imposed on Wire Netting by Federal Government as a check to German competition, and to assist the already established industry.

American Shipping Developments

are watched with keen interest from this side of the Pacific, and we note the new direct line to be run from San Francisco to Manila under the United States navigation laws.

Spreckels & Co. of San Francisco deserve, so far as a reward for persistency goes, the subsidy they seek from Australia in connection with the mail service. But the radical press out here are just now pointing out the effect of the working of the American navigation laws on our local companies. Our Union Steamship Company were debarred from carrying passengers or cargo between Hawaii and San Francisco when the laws were applied to the Sandwich Islands after annexation by the United States.

Australia does not in the least object to this policy, which indeed she would like to emulate, but certain sections of the Australian press draw attention to the fact that America buys but little from us, though she sells us much. Spreckels & Co. are wise in seeking a subsidy, but this should come from the American Government, not from the country whose steamers have been forced by American legislation from the Pacific trade.

The Commercial Supremacy of the Pacific

will be the keynote to the ultimate success and supremacy of your goods in Australasian markets, to say nothing of the capture of the island trade and the New Zealand trade *en route*; perhaps a mere trifle to consider, but a trifle which at present is almost entirely enjoyed by British makers.

Bleasby & Co., wholesale ironmongers, King street, Melbourne, suffered by fire to the tune of £10,000 some days ago. Their travelers, however, kept the road as though nothing had happened.

DEVELOPMENT OF LOCAL JOBBING HOUSES.

FROM A SPECIAL CORRESPONDENT.

NEW ENGLAND people are noted for their conservatism: the blow and bluster that is a part of the business life in the West is missed from business methods in the East. There is, nevertheless, as much energy and enterprise among the Hardware trade of New England as is found in any other part of our country.

This life and activity has been much developed the past ten years and is manifest in many ways; it is more noticeable perhaps among the jobbers in cities outside of Boston. What were 15 years ago only small Hardware concerns have developed into jobbers who travel three or four salesmen. This has been done by adding new lines, by carrying more complete stocks, catering closely to the wants of the small merchant and by covering the territory often and working it hard. It is due to modern methods and also to a strong growing trade that these comparatively insignificant concerns of a few years ago have now become large influential Hardware establishments of the first class and factors in the trade.

Such a concern are the Peirson Hardware Company of Pittsfield. This firm have in the past ten years increased their business about threefold, having added many kindred lines and making a strong effort on Sporting Goods. In this line the Peirson Hardware Company are doing an extensive business, both in a retail and in a jobbing way. The firm's energy and enterprise are shown in many ways. Their advertising is not only original but exceedingly attractive. The same store and warehouse have been occupied by the Peirson Hardware Company and their predecessor for upward of 25 years. The location being in the center of the retail district of Pittsfield, the firm have taken advantage of this fact in their advertising. On the tags that are used for the retail business the address is given as "The Peirson Hardware Company. Right in the center of the city."

Another New England Hardware concern who are growing and have grown very much in the past few years are the Brockway-Smith Corporation of Lynn. They have succeeded in comparatively a few years' time in building up an extensive jobbing and retail trade, and each year are taking on more lines and extending their business. Besides a full line of Hardware and Sporting Goods, the Brockway-Smith Corporation do a large business in Builders' Supplies and in Blinds and Doors. These latter goods are sold throughout Eastern Massachusetts and through Maine. The firm also do a retail business in Builders' Supplies, and use some very unique advertising, Mr. Smith looking personally after this department.

The business of the smaller jobber is growing, and it would seem that there is more future for him than there would be for the big jobber who sells the larger trade.

W. R. OSTRANDER & CO.'S NEW CATALOGUE.

W. R. OSTRANDER & CO., 22 Dey street, New York, have just issued the thirteenth edition of their illustrated trade catalogue, containing 296 pages. In it are shown large assortments of Speaking Tube Hardware, Electric Bells and Batteries, Electric Lighting Material, Telephone and Telegraph Instruments, and general lines of Electrical Supplies, of which they are large manufacturers. They also deal largely in Bell Hangers' Hardware and Electricians' Tools.

WARWOOD TOOL COMPANY'S NEW CATALOGUE.

WARWOOD TOOL COMPANY, Wheeling, W. Va., have just issued illustrated catalogue No. 3 of the goods of their manufacture, including Picks, Mattocks, Grub and Hazel Hoes, Coal Miners' Tools, Sledges, Crow Bars, Wedges, Mauls, and Hammers of various kinds. This business was established in 1854. For such trade as requires styles of this class of goods different from

those illustrated in this catalogue special prices will be quoted from samples or sketches sent.

EIGHTH ANNUAL SPORTSMEN'S SHOW.

THE eighth annual Sportsmen's Show at the Madison Square Garden, New York, which closed Wednesday night, March 19, after a run of two weeks, was the most successful and largely attended of any of the exhibitions in the history of the Sportsmen's Association.

Among the trade exhibits was that of the J. Stevens Arms & Tool Company, Chicopee Falls, Mass., who displayed a varied line of fine Rifle Pistols, Rifles, Shot Guns, Telescopes for Rifles, &c., some of which, although of excellent quality, are very moderately priced.

The Bridgeport Gun Implement Company, 313-315 Broadway, New York, exhibited Mills' standard Aluminum Clubs and other Golf goods, including Caddie Bags, together with an assortment of Tennis Goods. The Remington Arms Company, Ilion, N. Y., displayed their large line of Rifles for the use of adults and juveniles, including sporting and military Rifles, Cadet Rifles, &c. The Union Metallic Cartridge Company, Bridgeport, Conn., showed their extensive product in a large mahogany arch.

In space 20 was the display of the Peters Cartridge Company, Cincinnati, Ohio, and 80 Chambers street, New York. The products of this concern include Ammunition of various kinds for rifle, pistol, revolver and gun.

Among the other exhibitors was Tatham Bros., 82 Beekman street, New York, Lead Shot; Markle Lead Works, St. Louis, Mo., Shot, Targets, Clay Pigeons, &c.; Leroy Shot & Lead Works, 261 Water street, New York, Shot, and D. T. Abercrombie, & Co., 2 and 3 South street, Sportsmen's Outfits and Supplies.

The Marble Safety Axe Company, Gladstone, Mich., had a comprehensive exhibit of sporting specialties, in which were various styles of Safety Pocket Axes, Hunting Knives in great variety, Woodsman's Compasses, Waterproof Match Boxes, Ball Bearing Steel Cleaning Rod for Rifles, Fish Knives, Automatic Gaff Hooks, Broken Shell Extractor, Gun Sling, Front Gun Sight and Seat Pad for fishermen, a number of which are entirely new in the trade.

There was a very interesting and large display of Indian goods in the music room, adjoining the main exhibit. Here were shown in profusion Navajo Blankets, Baskets of sweet grasses in various colors, Bows, Arrows, Canoes of birch bark, Paddles, Snowshoes, Indian Drums and a great number of similar goods, some of which were made on the premises by the Indians themselves.

AMERICAN HARDWARE CORPORATION.

THE details have been completed by which the interests of the great Hardware manufacturing concerns of P. & F. Corbin and Russell & Erwin Mfg. Company, New Britain, Conn., have been merged into the American Hardware Corporation. These details were formally completed at a meeting of the directors of the constituent companies, held in New Britain, at the office of P. & F. Corbin, on the 13th inst. The following are the board of directors of the new corporation: Hon. Philip Corbin, Andrew Corbin, Charles M. Jarvis, Charles H. Parsons, Charles Glover, George J. Loughton, Andrew J. Sloper, Howard S. Hart, William G. Smythe.

The board of directors chose the following officers:

PRESIDENT, Hon. Philip Corbin.
FIRST VICE-PRESIDENT, Charles M. Jarvis.
SECOND VICE-PRESIDENT, George J. Loughton.
TREASURER, A. J. Sloper.
ASSISTANT TREASURER, Charles E. Wetmore.
SECRETARY, Theodore E. Smith.

Less than one-tenth of the stock of the subordinate companies remains as yet untransferred. This clearly emphasizes the disposition of the stockholders toward the merger, considering that scarcely two weeks has elapsed since the announcement of the plan was sent out to the stockholders. The time limit fixed at that time for the transfer of stock was April 1, and there is

little room for doubt that by that day all the stock will have been exchanged.

The articles of incorporation have been filed with the Secretary of State and with the Town Clerk, and from this date the affairs of the two companies will be conducted under the one head.

SURPLESS, DUNN & CO.

SURPLESS, DUNN & CO., 55 Warren street, New York, were damaged by water as the result of a large fire that started at 8.30 p.m. Saturday night, March 15, in one of the upper floors of the building, occupied by the New York Bag Company. Surpless, Dunn & Co. occupy the street floor and two basements, and while the fire did not touch them, they were wet down considerably and had several feet of water in the subcellar. For the present they are using the second floor of 53 for office purposes and carrying on their business as usual.

TRADE ITEMS.

THE LAMB WIRE FENCE COMPANY of Adrian, Mich., have decided to establish a branch at Davenport, Iowa. This branch will be organized as the Western Fence Company and will turn out some 25 different styles of Woven Wire Fence. The Davenport branch will operate in the territory which covers Minnesota, Iowa, Missouri, Kansas, Nebraska, together with the west half of the two States of Wisconsin and Illinois. A factory site has been purchased, consisting of 15 acres, lying a short distance west of the city limits. It is hoped to have the machinery ready for operation early in the fall. George H. Barnes of Davenport is president of the new company, H. F. Alverson of Omaha is secretary and Eugene M. Smith of Owatonna, Minn., is treasurer.

THE CLINTON WIRE CLOTH COMPANY, Clinton, Mass., are about to remove their New York office and warehouse from 76 Beekman street to 33 Park place, near Church street. This branch has been in the neighborhood of their present address for about 30 years and in the building about to be vacated for 15 years. In the new quarters they will have more room and greater facilities for the expeditious dispatch of business, at the same time being more in touch with the trade with which they are identified.

FRED BUCK, manager of the Lufkin Rule Company, Saginaw, Mich., recently visited the National Bureau of Standards in Washington, D. C., in company with H. G. Hollis, who is manager of the New York branch. While in Washington Mr. Buck appeared as a witness before the Congressional Committee on Coinage, Weights and Measures, who are considering the features of a bill on the adoption of the metric system. On this trip they also visited the trade in both Philadelphia and Washington. The Lufkin Rule Company recently received an order for Lufkin Tape Rules for use in the Royal Arsenal, Woolwich, England.

JOHN R. GILFILLAN, who for a number of years past has represented Capt. J. F. Morgan on the road, is now acting as traveling representative for the Belfont Iron Works of Ironton, Ohio.

JAMES S. BARRON & Co., 24-30 Hudson street, manufacturers, exporters and wholesale dealers in Wooden Ware, Brooms, Rope and analogous lines, will on or about May 1 move to a building they have bought at the intersection of West Broadway and Franklin street. The building has six stories and basement, each about 75 x 90 feet, which they are now preparing to meet the requirements of their large business, which was established in 1849.

R. H. INGERSOLL & Bro., 163-165 Washington street, New York, have opened a branch of their house in Chicago, on the eighth floor of the Masonic Temple. At this headquarters they will not only carry a complete stock of the various Ingersoll Watches, now comprising seven numbers, but will also supervise all shipping west of Ohio and maintain a complete office force to cover the various details of the business. They have recently issued a 16-page illustrated booklet devoted exclusively to the Watch portion of their business.

AMONG THE HARDWARE TRADE.

Joseph E. Galigher, Salt Lake City, Utah, has severed his connection with the Scott-Strevell Hardware Company of that city, and is organizing a mining supply and machinery house, which will be ready for business about May 1. It will have a capital of \$100,000, paid in.

Daniel Wood has sold a half interest in his Hardware, Stove and Agricultural Implement business in Hillsboro, Iowa, to R. E. Watts, and the style has become Wood & Watts.

A. T. Swanson has just moved his stock of Hardware, Stoves &c., from Marysville to Pony, Mont., where he occupies a new store building. Mr. Swanson carries a full line of Hardware, Stoves, Glass, House Furnishing Goods, and also conducts a tin shop.

H. M. Bailey has lately opened up in the wholesale and retail business in Sheffield, Ala. His stock comprises Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Paints, Brushes, Cement, China, Glassware, &c. Mr. Bailey has a new store, which has been specially fitted up for the business.

John Van Arb has disposed of his interest in the firm of Stilwell & Van Arb, Carrollton, Mo., to T. M. Rucker, and the style is now Stilwell & Rucker. The new firm expect to remodel the shelving and make a number of other improvements in the establishment.

G. R. Dill has disposed of his Hardware, Stove and furniture business in Belvidere, Neb., to Sigel Matson, who will continue at the old stand.

J. S. Ayres, dealer in Shelf and Heavy Hardware, Ventura, Iowa, has sold out to E. L. Bragger.

The A. P. Boswell Hardware & Implement Company, Coffeyville, Kan., have disposed of their business to the Brown Supply Company of the same place.

J. T. Whitfield has sold his Hardware, Stove and Sporting Goods business in Warrensburg, Mo., to Ben. T. Sams.

G. H. Griswold is successor to Holton & Lawyer in the Hardware, Stove and Agricultural Implement business in Tennessee, Ill.

W. H. Millspaugh has moved his Hardware and Stove business from 23 and 25 Phelps street, Oneida, N. Y., to 45 Main street, where he will also conduct a first-class tin and jobbing shop. Mr. Millspaugh is also interested in the Bicycle and Fishing Tackle business of W. H. Robinson & Co., in the same town.

E. Comstock & Son, Herscher, Ill., have disposed of their Hardware, Paint, Harness and Farm Implement business to Cook & Duckworth.

M. C. Price, dealer in Hardware, Paints, &c., Richmond, Ind., has sold his business to Wm. H. A. Gord, formerly of Lionsville, Ind.

Herman Schroeder has lately completed an addition to his Hardware store in Shakopee, Minn., which will enable him to add materially to his stock. Besides Hardware, Stoves, Agricultural Implements and Sporting Goods Mr. Schroeder also deals in flour and feed. He also manufactures brick.

Hoy & Schroeder, dealers in Heavy and Shelf Hardware, Stoves, Furnaces, Tinware, Sporting Goods, Plumbing Goods, &c., Postville, Iowa, have been succeeded by Schroeder & Stone, Mr. Schroeder having taken into partnership with him E. S. Stone.

Drake Hardware Company, Burlington, Iowa, have recently taken possession of their fine new building. This building is situated on Washington street, with a frontage of 58 feet and a depth of 124 feet. An ell in the rear running east on Front street is 110 x 45 feet, affording excellent railroad track accommodations. The establishment has been constructed with special care and is admirably adapted to the exacting requirements of the business. It is most advantageously located, being midway between the Burlington & Cedar Rapids and C. B. & Q. freight houses and within a stone's throw of the freight houses of the packet lines that run between St. Louis and St. Paul and the local freight steamers, and within a block and a half on the north from the new line of the Muscatine North and South road, which will be running trains into Burlington within a short time.

Among the stores which were destroyed in the great Paterson, N. J., conflagration a short time since was the Hardware and Mill Supply establishment of H. W. Mills & Co. In a card announcing the fact that they are now located at 59 Washington street, corner of Fair, and are ready for business, the following philosophic poem appears:

'Tis easy enough to be pleasant
When life flows along like a song,
For the man worth while is the one who will smile
When everything goes dead wrong.
For the test of the heart is trouble,
And it always comes with the years,
And the smile that is worth the praise of earth
Is the smile that comes through tears.

The partnership heretofore existing under the firm style of Brooks & Deming, Montpelier, Vt., has been dissolved by mutual consent. John V. Brooks has sold his interest in the Hardware and Paint business, and will continue the Door, Sash and Glass business at the old stand. Chas. H. Deming having sold his interest in the Door, Window and Glass business to his former partner, will continue the Hardware and Paint business under the style of the Deming Hardware Company. Mr. Deming intends to carry a large and more complete assortment of Hardware and Paints, and will put in new fixtures and make other improvements in the store with a view to making it more attractive and convenient.

Zach Potter has become manager of the Dean Hardware Company's store in Columbus, Ohio. Mr. Potter still retains his interest in the Hardware firm of Potter Bros., Delaware, Ohio.

J. F. Van Deren has sold a half interest in the Van Deren Hardware Company, Lexington, Ky., to W. M. Van Deren. The style will continue unchanged. The concern are wholesalers and retailers of Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c. They are putting two more traveling salesmen on the road.

The Hardware store of Haines Bros., Lumb, Mich., was recently destroyed by fire. The loss was covered by insurance.

Morton Hardware Company, Birmingham, Ala., have been organized with a capital of \$5000. Their line comprises Hardware, Shelf and Heavy, Stoves and Tinware, Agricultural Implements, Sporting and Athletic Goods, &c.

SARGENT & CO.'S SPRING AND SUMMER GOODS CATALOGUE.

SARGENT & CO., New Haven, Conn., and 149-153 Leonard street, New York, have just issued, with an accompanying discount sheet, a finely illustrated catalogue of 80 pages, the page size of their regular catalogue, which shows large lines of spring and summer goods, particularly Wire Screen Hardware in great variety, together with assortments of Butts, various kinds of Bolts, Pulls, Plates, Letters and Figures, Shutter

Knobs, Lifts, Door Holders, Hooks, Hammock Hooks and Refrigerator Catches. There are also such distinctly Summer goods as Trowels, Ice Axes and Picks, Awning Hardware, &c.

MISCELLANEOUS NOTES.

The Tower Mfg. Company.

The Tower Mfg. Company, Madison, Ind., have added to their former line of tacks, nails, staples, &c., coopers' and tinnners' rivets and coppered and tinned belt rivets and burrs and washers. They have also lately put on the market two very attractive packages of carpet tacks under the names of Excelsior and Pan-American tacks. All of the above, together with their former line, are shown in a new catalogue recently issued by the company.

Ping-Pong.

Parker Brothers, Salem, Mass., for whom Dame, Stoddard & Co., Boston, Mass., are wholesale distributors to the trade, are manufacturing the fashionable game of Ping-Pong under exclusive rights to this trade-mark name in the United States, in connection with table tennis. There are several varieties of outfit, varying in quality and appearance according to the price, the following being the assortment ranging from \$16 per dozen, net, to the trade, to \$60, net, per dozen. The sets are named Alpha, Brunswick, Clarendon, Dartmouth, Foxcroft, Glencourt and Hampshire, the first being the lowest in price, and so on to the last, which is the most expensive. The cheapest set includes two battledores, polished balls, wood net frame and Globe net. The best set has fine double headed Inverness battledores, special net posts, best green net, 12 ping-pong balls and is handsomely boxed.

Acme Ball Bearing Bed Caster.

Smith & Hemenway Company, 296 Broadway, New York, are putting on the market another form of their Acme ball bearing caster, here illustrated. This is No. 660, and is intended for brass and iron bedsteads. It is made to fit a bed with two posts of, say, 1½ and 2 inches diameter, and can be furnished in brass or nickel finish.

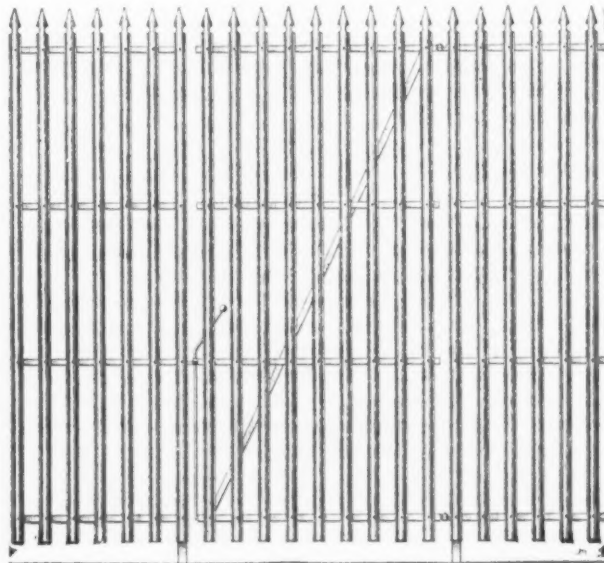


Acme Ball Bearing Caster for Metallic Bedsteads.

ishes. The spring feature makes it easily adjustable to the bed, as well as giving a secure footing. In this caster the weight falls directly over the center of gravity. The surface of the ball revolves upon the smaller balls, which are automatically interchangeable upon a steel disk, and moves in any direction with slight pressure. These casters can be supplied with either solid or hollow surface balls. With each caster of this character a shipping plug is furnished which fits inside the bed post, and is flanged at the bottom similarly to the caster itself, so that while being transported waste or trash of any kind is prevented from getting into the post. The company refer to the caster as practically indestructible, noncorrosive and dust proof, and state that it will not clog, stop or wear to an appreciable degree, or injure carpets.

The World's Fair Fence.

The fence shown herewith, manufactured by Mesker & Brother, St. Louis, Mo., will be used to inclose the park side of the Louisiana Purchase Exposition Grounds. The manufacturers state that this style and design of fence was especially prepared for this purpose, and that



The World's Fair Fence.

it was selected for its cheapness, durability and neat appearance. It is made entirely of steel pressed into its molded form, consisting of end, line and gate posts, rails, pickets and gates. The fence is now made in various heights suitable for residences, public parks and cemeteries.

Steel Shop Piling Boxes.

The Cleveland Wire Spring Company, Cleveland, Ohio, have just put on the market the patented piling box here illustrated. This box is designed to serve a purpose similar to their steel tote box, for carrying goods about the factory in various stages of manufacture, but this box is so made with steel pieces riveted to the sides and extending a short distance below the bottom of the box that the boxes can be piled three to five high on a

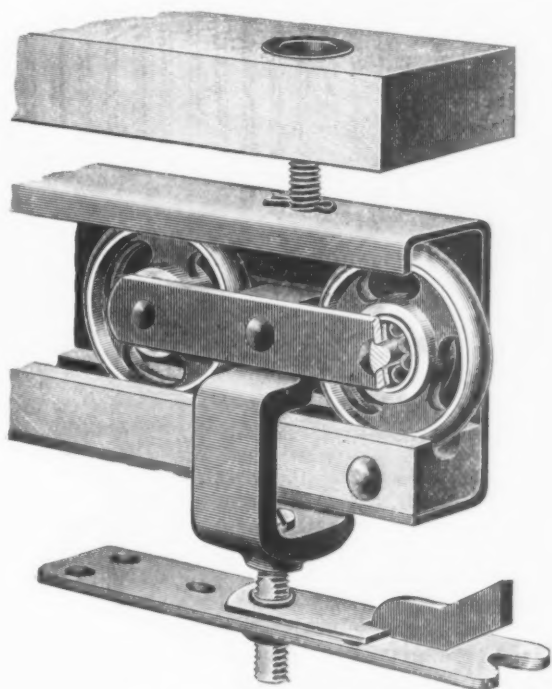


Steel Shop Piling Boxes.

truck and trundled about without danger of their slipping off or injuring the articles in the box. They can also be piled 18 or 20 high and stand firm on the floor without toppling over. The regular stock sizes are 18 x 10 x 5 inches in dimensions in gauges of Nos. 18 and 16 metal.

The Ferris Noiseless Door Hanger.

The Wilcox Mfg. Company, Aurora, Ill., have brought out the house door hanger herewith illustrated. The hanger combines the good points of a variety of hangers which have proved popular with the trade. In the first place, it is made to use an overhead center stop, which is referred to as a great improvement on the old method of stopping the door at its back. In the second place, the steel track is heavy, consequently absolutely rigid, and is adjustable, which is alluded to as a feature of great importance, as buildings will settle. The hanger is also adjustable, thus securing an additional adjustment. The steel track has a wooden shoe fastened to it, which is rigidly attached. The combination of the steel and wood track, it is pointed out, is an exceedingly desirable feature, as the track is thus made noiseless, as well as of proper strength. The wood track is constructed of hard maple to resist wear. The bearings of the hanger are of the type of bicycle journals, being ball bearing and case hardened. The track is so constructed



The Ferris Noiseless Door Hanger.

that single doors can be hung with all the features of adjustment that are applicable to double doors. Another important point to which attention is directed in connection with this hanger is that dealers are only obliged to carry half as many sizes as usual on account of the way in which the track is put up. Thus they are relieved from the necessity of carrying a great variety of track.

The "New" Punching Bag.

H. D. Crippen, 52 Broadway, New York, is the manufacturer of the "New" punching bag, shown in the accompanying illustrations. Fig. 1 illustrates the professional "New" punching bag, Fig. 2 being a sectional view more clearly showing the working parts. The frame, which can be screwed to a window or door casing, wall or similar place, requires only 6 x 6 inches space, and for a slight extra charge will be furnished with a sheet rubber backing cut to shape. What is claimed for this construction is that it is noiseless and rapid, and that the speed can be adjusted to the individual's fancy. The frame or arm is of malleable iron 20 inches long, and furnished regularly in aluminum finish, although for fine apartments the whole outfit, which weights but 10 pounds complete, can be supplied in a finish to match varied styles of wood work and decoration, the bags being supplied in tan, red, white, green and yellow. The bag, 10 inches in diameter, moves in a chronometer or universal balance, made of annealed iron, the bearings of which are cone pointed screws, case hardened, the ad-

justments being made with hexagon lock nuts. When in use the action is accentuated by the rubber buffer A in Fig. 2 striking the cup of the metal frame, which causes a rapid return of the bag. By means of the cone pointed adjusting screws the speed can be increased or



Fig. 1.—"New" Punching Bag and Frame.

lessened at will. Letter B indicates the universal joint, which allows the bag to swing in any direction below the cup. The bag is suspended by means of a machine turned steel swing rod, nickel plated, $\frac{5}{8}$ inch in diameter, and brazed to a $5\frac{1}{2}$ -inch steel plate on the lower end of the rod, which is sewed between pieces of heavy horse hide and grain leather to prevent injurious friction with the interior rubber bladder. As the bag does not come in contact with anything but the person of the individual it is noiseless and can be used in apartment houses, hotels, &c., without annoyance to the occupants of adjoining rooms, while from the compactness of the entire outfit it requires little room and can be put almost any-

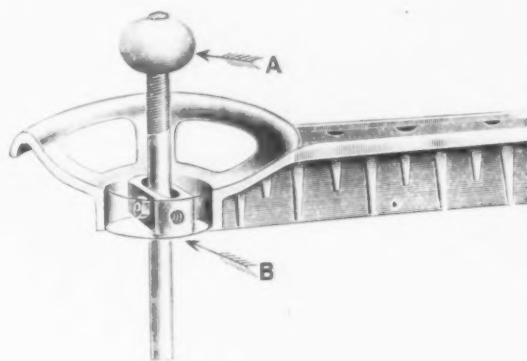


Fig. 2.—Sectional View of Working Parts.

where. The house also make a bag for children, of the same general character, except that the frame is 14 inches long, and, complete with bag, weighs 6 pounds. Still another bag, with a straight arm, is made for adults, at a reduction in price. This bag weighs 8 pounds. Mr. Crippen is also prepared to furnish a complete line of baseball mitts and gloves, boxing gloves, striking bags of the regular kind, &c.

E. B. Mundy has lately opened a Hardware store in Avoca, O. T., handling also Stoves and Tinware, Agricultural Implements, Sporting Goods, &c.

Sure Grip Malleable Tank Lugs.

The Racine Tank Lug Company, Racine, Wis., are manufacturing the Sure Grip lugs, to be used in fasten-

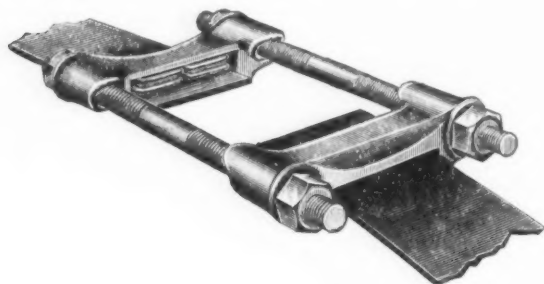


Fig. 1.—Lug for Two Bolts.

ing the bands of tanks. They are made in a variety of styles, several of which are herewith illustrated. Fig. 1 shows a lug for two bolts, two key wedges being used

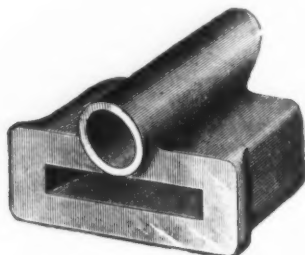


Fig. 2.—Single Bolt Lug.

side by side. This lug is used for bands exceeding 3½ inches in width. Fig. 2 shows a single bolt lug. Fig. 3 shows a single bolt lug with the side cut away to expose

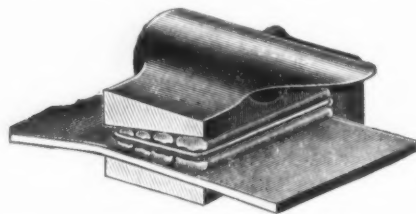
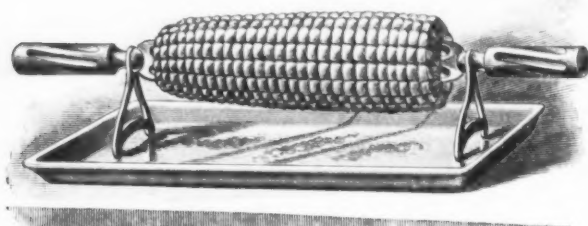


Fig. 3.—Showing Key Wedge and Band of Single Bolt Lug.

the key wedge and band. The lugs are made of malleable iron, and are referred to as being not only simple and easily applied, but as very strong.

Perfection Corn Forks.

F. P. Pfeeghar & Son, New Haven, Conn., are putting on the market the Perfection corn forks, shown herewith. The directions for using these corn forks are as

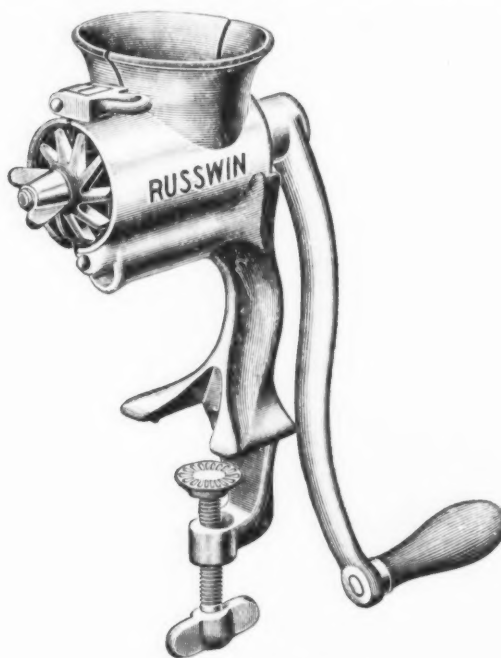


Perfection Corn Forks.

follows: Before the corn is cooked the ends of the cob should be snipped off square. After cooking the prongs of the forks are inserted in the cob ends as near center as possible. By turning either fork the corn revolves, so that it may be seasoned without inconvenience.

Russwin Food Cutter.

Russell & Erwin Mfg. Company, New Britain, Conn., and 43-47 Chambers street, New York, have just begun the manufacture of the Russwin food cutter, here illustrated. This food cutter is made in two sizes, Nos. 1 and 2, for family use, the No. 2 being the larger of the two. Four cutters in all are furnished, three of which are similar to the one seen in the illustration, except that they vary as to product, fine, medium and coarse, the remaining cutter being of a different character for grinding nuts into a pastelike mass or butter. This cutter is



Russwin Food Cutter.

practically in two parts; the worm screw and cutter and the hinged shell, held together at the top by a pivoted loop. There is a gutter underneath a part of one shell to catch juice of meat, fruit or vegetables and conduct it so as to drop with the cut material into the receptacle used for that purpose. The cutter can be opened instantly and cleaned quickly. It stands well above the table and permits of the use of a large dish. It is self sharpening, and is said not to squeeze the material treated, but actually cuts it. The cutter is tinned, and can be readily attached to table or shelf.

Standard Spray Pump.

The Admiral Lamp Company, Marysville, Ohio, are manufacturing the Standard spray pump, here shown, Fig. 1 illustrating the pump as in use and Fig. 2 being a



Fig. 1.—Standard Spray Pump.

sectional view of the working parts. The pump is made entirely of brass, with two solid brass ball valves, and is 27 inches long. There are no leathers, washers or suckers, or castings to rust and produce leaking joints. It can be used with bucket, knapsack, tank or barrel for spraying orchards, gardens and vineyards; also for whitewashing, disinfecting chicken houses and extinguishing small fires. With the pump are provided two

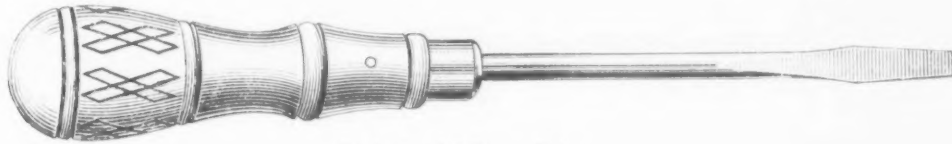


Fig. 2.—Sectional View of Working Parts.

interchangeable nozzles, No. 1 throwing a solid stream 50 to 60 feet. No. 2 attached to No. 1 throws a fine spray 28 feet, while No. 2 attached direct to the pump throws a coarser spray 40 feet. The company can also furnish a kerosene attachment, which is so constructed that the quantity of oil used can be instantaneously adjusted.

Gay's Special Screw Driver.

George E. Gay, Augusta, Maine, is offering a line of screw drivers, one size of which is shown in the accompanying cut. The blades are forged from special tool

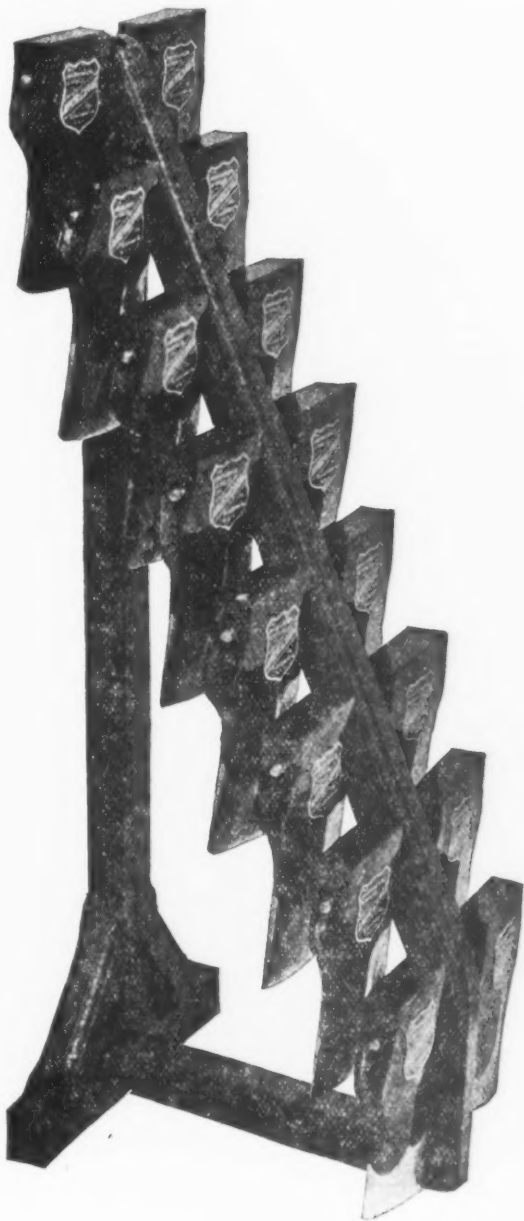


Gay's Special Screw Driver.

steel and the handles are of rosewood finish. A steel pin is driven through the handle and blade to prevent the blade turning or getting loose. The handles are embossed, making them easy to grip hard and to prevent slipping in the hand. Every screw driver, it is remarked, is carefully tested at the factory. They are made in eight sizes, from 3 to 12 inch, inclusive.

The Eureka Axe Stand.

The accompanying illustration represents an axe stand offered by W. N. Martin, Hickory, N. C. The stand holds 16 axes, and is referred to by the manufac-



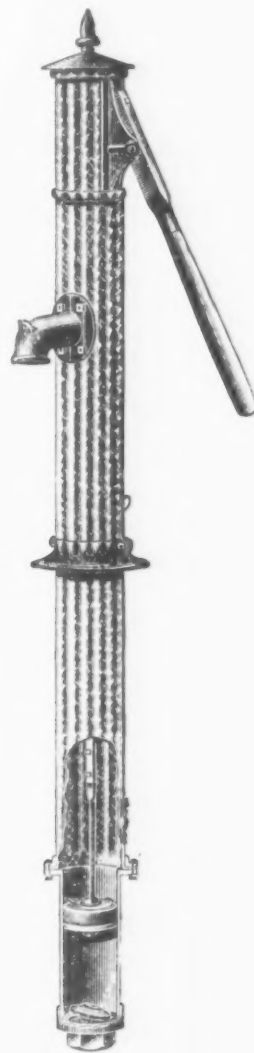
The Eureka Axe Stand.

turer as facilitating the sale of this line. It is stated that the axes can be placed in any position on the stand, and that they will not overbalance.

Twentieth Century Pump.

The Berger Mfg. Company, Canton, Ohio, have bought out the Twentieth Century corrugated galvanized steel pump, here illustrated. The body of the

pump is of corrugated form which gives greatly increased strength as well as allowing something for expansion in freezing weather. A special device enables an individual to open an outlet so that a vent is provided for all water contained in the pump as a preventive in times of low temperature. The cast iron base is adjustable, and can be set at any height to suit the user. The cylinders are cast iron, and are referred to as sim-



Sectional View of Twentieth Century Pump.

ple and strong. The pump can be quickly set up, lifts the water easily, and delivers it rapidly. Especial attention is called by the manufacturers to the fine quality of material and workmanship of the pump.

The copartnership formerly existing between Edward L. Rich and Harry E. Clark, under the firm name of Rich & Clark, Easton, Md., has been dissolved. H. E. Clark & Co., Limited, will continue the wholesale and retail business in Hardware, Farm Implements, Seeds, &c., at the old stand. Mr. Rich will represent the Simmons Hardware Company of St. Louis in the East, making Baltimore his headquarters.

Galvanized Oily Waste Can.

The Steel Basket Company, Cedar Rapids, Iowa, have added to their galvanized specialties the oily waste can which is herewith illustrated. The can is corrugated, and has a riveted double bottom raised 4 inches from the floor. It is provided with a self closing metal cover, and is offered to the trade as a thoroughly safe receptacle for oily rags and waste, which are of a highly in-

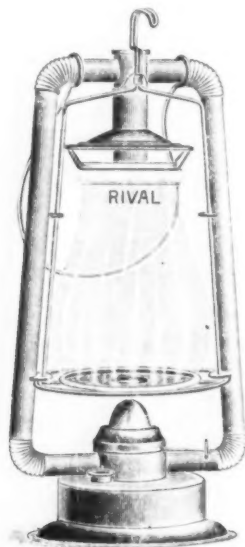


Galvanized Oily Waste Can.

flammable character. The can is regularly made in six sizes, but other sizes can be furnished to order. The company are making corrugated galvanized cans, pails and baskets. Their baskets are now made with a double bottom, strongly riveted all round, having no straps or rough places to injure clothing or shoulders.

Rival Tin Tubular Lantern.

The Berger Mfg. Company, Canton, Ohio, are the makers of the Rival tin tubular lantern, here illustrated. It is made for $\frac{5}{8}$ and 1 inch wicks, as here shown, also with plain and bull's eye globes for dashboards.



Rival Tin Tubular Lantern.

It has a locked burner, simple top lift, patent one-piece crimped tubes and retinned, tested founts. The regular size is packed one dozen in a case, weighing, ready for shipment, 36 pounds.

The Hardware store of A. M. White & Son, Ossian, Ind., was destroyed by fire a short time since. The firm have decided not to resume business.

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Current Hardware Prices.

REVISED MARCH 18, 1902.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *at*. Thus 33½ *at* 33¼ *at* 10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33¼ and 10 per cent. discount.

Cut Prices.—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 1, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ½ doz. \$3.00... 33½ *at* 33¼ *at* 10%
North's... 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent... 25¢
Taplin's Perfection... 25¢

Ammunition—See Gun Cartridges, Shells, &c.

Anvils—American—

Arm and Hammer, Wrought... 85¢
Buel Patent, Wrought... 75¢
Eagle Anvils... 75¢
Hay-Budden, Wrought... 75¢
Horseshoe brand, Wrought... 75¢

Imported—

Peter Wright's... 91¢ *at* 90¢

Anvil, Vise and Drill—

Millers Falls Co., \$18.00... 20%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz... 25¢
Smaller Lots... 20¢
Lots of 3 doz... 30¢

Augers and Bits—

Com. Double Spur... 70¢ *at* 71¢
Boring Machine Augers... 70¢ *at* 71¢
Car Bits, 12-in. twist... 60¢ *at* 61¢
Jennings' Pattern... 50¢ *at* 51¢
Auger Bits... 50¢ *at* 51¢
Ford's Auger and Car Bits... 40¢ *at* 41¢
Forster Pat. Auger Bits... 20¢
C. E. Jennings & Co.:
No. 1 ext. lip. R. Jennings' list... 40¢
No. 30, R. Jennings' list... 50¢
Russell Jennings... 25¢ *at* 26¢
L'Hommedieu Car Bits 15x10 15x10 15x10... 40¢
Mayhew's Countersink Bits... 40¢
Pugh's Countersink Pattern... 20¢
Snell's Auger Bits... 50¢
Snell's Bell Hangers' Bits... 50¢
Snell's Car Bits, 12-in. twist... 60¢
Wright's Jennings Bits (R. Jennings' list)... 50¢

Bit Stock Drills—

Standard List... 50¢ *at* 51¢

Expansive Bits—

Clark's small, 1½ in.; large, 2 in... 50¢ *at* 51¢
Lavigne's Clark's Pattern, No. 1... 50¢
doz., 2 in... 50¢
C. E. Jennings & Co., Steer's Pat... 30¢
Swan's... 60¢

Glimlet Bits—

Common Double Cut, gro... 25¢ *at* 26¢
German Pattern... 25¢ *at* 26¢

Hollow Augers—

Bonney Pattern, per doz... \$11.00 *at* 11.50
Ames... 35¢ *at* 36¢
New Patent... 35¢ *at* 36¢
Universal... 20¢
Wood's Universal... 25¢

Ship Augers and Bits—

Ford's... 40¢
Snell's... 40¢
C. E. Jennings & Co.:
L'Hommedieu's... 15¢ *at* 16¢
Watrous'... 10¢

Awl Hafts, See Hafts, Awl.

Awls—

Brad Arty:
Handled... 25¢ *at* 26¢
Unhandled, Shouldered, gro... 25¢ *at* 26¢
Unhandled, Patent... 25¢ *at* 26¢
Peg Awls:
Unhandled, Patent... 30¢ *at* 31¢
Unhandled, Shouldered, gro... 30¢ *at* 31¢
Scratch Awls:
Handled, Common... 30¢ *at* 31¢
Handled, Socket... 30¢ *at* 31¢

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First Quality, factory brands... \$5.00
First Quality, jobbers' brands... \$5.75
Second Quality... \$5.00 *at* 5.25

Axle Grease—See Grease, Axle.

Axles—

Concord, Loose Collar... 40¢
Concord, Solid Collar... 40¢
No. 1 Common... 40¢
No. 2 Solid Collar... 40¢
Nos. 11 to 14... 70¢ *at* 71¢
Nos. 15 to 18... 75¢ *at* 76¢
Nos. 19 to 22... 75¢ *at* 76¢

Boxes, Axle—

Common and Concord, not turned... 15¢ *at* 16¢

Common and Concord, turned... 15¢ *at* 16¢

Half Patent... 15¢ *at* 16¢

Balances—Sash—

Caldwell new list... 60¢

Pollman's... 60¢

Spring—

Spring Balances... 5¢ *at* 10¢ *at* 6¢

Chatillon's... 40¢ *at* 10¢

Straight Balances... 50¢

Circular Balances... 50¢

Large Dial... 50¢

Per cent... 50¢

Barb Wire—See Wire, Barb.

Bars—Crow—

Steel Crowbars, 10 to 1½ in., per lb... 25¢ *at* 26¢

Beams, Scale—

Scale Beams, List Jan. 12, '92... 40¢ *at* 10¢

Chatillon's No. 1... 30¢

Chatillon's No. 2... 40¢

Beaters—Egg—

Standard Co.:
No. 9 Rip... \$4.50

No. 10 Dover Family Size... \$5.50

No. 15 Dover Hotel Size... \$12.00

Rova... \$8.00

Taplin Mfg. Co.:
No. 63 Improved Dover... \$5.50

No. 75 Improved Dover... \$5.50

No. 75-2 Improved Dover... \$5.00

No. 100 Improved Dover... \$8.00

No. 102 Improved Dover... \$9.50

No. 150 Improved Dover... \$15.00

No. 152 Improved Dover... \$15.00

Lyons' Standard size... ½ doz. \$1.75

Wonder (S. S. & Co.)... ½ doz. \$7.50

Bellows—

Blacksmith, Standard List... 70¢ *at* 71¢

C. E. Jennings & Co., Blacksmith... 60¢ *at* 61¢

C. E. Jennings & Co., Hand... 30¢

Blacksmiths—

Inch... 3 3½ 4 5 6 8 10 12

Each... \$3.50 3.75 4.25 4.50 5.00 5.50 6.15

Extra Length:
Each... \$4.50 5.50 6.50 7.50 8.50 9.50 10.50

Molders—

Inch... 9 10 11 12 14 16

Doz... \$2.75 2.25 2.50 2.50 12.00 14.50

Hand—

Inch... 6 7 8 9 10 12

Doz... \$3.75 4.25 4.50 5.00 5.7 6.75

Bells—

Ordinary goods... 75¢ *at* 76¢

High grade... 75¢ *at* 76¢

Jersey... 75¢ *at* 76¢

Texas Star... 50¢

Door—

Abbe's Gong... 45¢

Barton Gong... 55¢

Horne, R. & E. Mfg. Co.'s... 55¢ *at* 56¢

Lever and Pull, Sargent's... 40¢ *at* 41¢

Yankee Gong... 35¢

Hand—

Hand Bells, Polished... 60¢ *at* 61¢

White Metal... 55¢ *at* 56¢

Nickel Plated... 50¢ *at* 51¢

Swiss... 35¢ *at* 36¢

Silver Cling... 35¢ *at* 36¢

Miscellaneous—

Form Bells... 10¢ *at* 11¢

Steel Alloy Church and School... 50¢ *at* 51¢

National Bell Foundry Co.:
Superior Cast Steel Church and School... 50¢ *at* 51¢

Bells... 50¢ *at* 51¢

Wilmet & Hobbs Mfg. Co., Gongs... 70¢

Belting—Rubber—

Agricultural (Low Grade)... 75¢ *at* 76¢

Common Standard... 75¢ *at* 76¢

Standard... 75¢ *at* 76¢

Extra... 60¢ *at* 61¢

High Grade... 50¢ *at* 51¢

Boston Belting Co.:
Seamless Stitched, Imperial... 45¢ *at* 46¢

Boston... 50¢ *at* 51¢

Niagara... 60¢ *at* 61¢

Leather—

Extra Heavy, Short Lap... 70¢ *at* 71¢

Regular Short Lap—

Standard... 60¢ *at* 61¢

Light Standard... 60¢ *at* 61¢

Leather Lacing... 60¢ *at* 61¢

Cotton—

Rosendale-Bedaway B. & H. Co.:
Sphinx Brand... 60¢ *at* 61¢

Durable Brand... 70¢

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters... 20¢

Stoddard's Lightning Tire Upsetters... 40¢ *at* 50¢

Bicycle Goods—

John S. Lang's Son's 1899 list:
Chain... 50¢

Parts... 50¢

Spokes... 50¢

Tubes... 60¢

Bits—

Auger, Glimlet, Bit Stock Drills, &c.—
See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—Tackle—

Common Wooden... 70¢ *at* 71¢

Cleveland's tool... 60¢ *at* 61¢

Ford's Star Brand Self Lubricating... 60¢ *at* 61¢

Hollow Steel, Ford's Pat. Star Brand... 50¢ *at* 51¢

Lane's Patent Automatic Lock and Junior... 30¢

Stowell's Novelty, Mal. Iron... 50¢ *at* 51¢

See also Machines, Hoisting.

Boards Stove—

Zinc, Crystal, &c... 40¢ *at* 41¢

Bolts—

Carriage, Machine &c.—
Common, List Jan. 12, '92... 60¢ *at* 61¢

Norway Iron, \$3.20, list Oct. '91... 54¢

Phila. Eagle, \$3.00, list May '91... 50¢ *at* 51¢

Bolt Ends, list Jan. 30, '92... 70¢ *at* 71¢

Machine, list Oct. 1, '91... 70¢ *at* 71¢

Machine with C & T. Nuts... 70¢ *at* 71¢

NOTE.—Jobbers are in many cases underselling the manufacturers.

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:
Inch... 3 4 5 6 8

Per doz... \$1.50 3.00 3.50 4.50 5.50

Cast Iron Spring Foot:
Inch... 6 8 10

Per doz... \$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:
Inch... 6 8 10

Per doz... \$1.75 1.00 1.30

Cast Iron Shutter, Brass Knobs:
Inch... 6 8 10

Per doz... \$1.50 3.00 1.00

Wrought Barrel Brass Knob:
Inch... 3 4 5 6 8

Per doz... \$1.50 3.00 3.50 4.50 5.50

Wrought Barrel... 70¢ *at* 71¢

Wrought Flush, B. K... 50¢ *at* 51¢

Wrought Shutter... 40¢ *at* 41¢

Wrought Square Neck... 50¢ *at* 51¢

Wrought Shank... 50¢ *at* 51¢

Ives' Patent Door... 60¢

Stove and Prow—

Plow... 60¢ *at* 61¢

Store... 70¢ *at* 71¢

Tire—

Common... 70¢ *at* 71¢

Norway Iron... 80¢ *at* 81¢

America's S-rev Company:
Norway Phila., list Oct. 16, '94... 80¢

Eagle Phila., list Oct. 16, '94... 80¢

Bay State, B. Dec. 28, '99... 70¢

Franklin Hoop Co.:
Norway Phila., list Oct. 16, '94... 80¢

Eagle Phila., list Oct. 16, '94... 80¢

Ellipses, list Dec. 28, '99... 70¢

Port Chester Bolt & Nut Company:
Empire, list Dec. 28, '99... 70¢

Keystone Phila., list Oct. '94... 80¢

Norway Phila., list Oct. '94... 80¢

Union Nut Co.:
Tire Bolts... 70¢

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch... 1 1½ 2 2½ 3 3½ 4 4½ 5 5½ 6 6½ 7 7½ 8 8½ 9 9½ 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66

Cartridges—

Blank Cartridges:	
32 C. F., \$5.50	10¢55
32 C. F., \$7.00	10¢55
22 cal. Rim., \$1.50	10¢55
32 cal. Rim., \$2.75	10¢55
B. B. Caps, Con., Ball Sngl.	\$1.90
B. B. Caps, Round Ball	\$1.40
Central Fire	25¢
Target and Sporting Rifle	15¢10
Primed Shells and Bullets	15¢10
Rim Fire Sporting	30¢
Rim Fire Military	15¢55

Castors—

Bed	70¢10
Plate	70¢10
Philadelphia	70¢10
Boss	70¢10
Ross Anti-Friction	70¢10
Marlin's Patent (Phoenix)	45¢
Payson's Anti-Friction	70¢10
Standard Ball Bearing	45¢
Tucker's Patent low list	30¢

Cattle Leaders—

See Leaders, Cattle.	
Chain, Coil—	
American Coil, Cask lots:	
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	75¢10 75¢10 75¢10 75¢10
8-20 6-19 5-10 4-35 4-15 4-10 4-10	1 to 14 inch.
3-35 4-30 4-30	per 100 lb.
Less than Cask lots add 25¢.	
German Coil	60¢10 60¢10

Halters and Ties—

Halter Chains	60¢10 60¢10 60¢10
German Halter Chain, list July 25	60¢10 60¢10 60¢10
Cor Ties	60¢

Trace, Wagon, &c.—

Traces, Western Standard:	100 pair
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	35¢00
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	35¢00
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	35¢00
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	35¢00
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	35¢00
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	35¢00
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4	35¢00

Miscellaneous—

Jack Chain, list July 10, '93:	
Iron	60¢10 60¢10 60¢10
Brass	60¢10 60¢10 60¢10
Safety Chain	70¢55 70¢10
Gal. Pump Chain	lb. 45¢45
Covert Mfg. Co.	
Breast	35¢25
Halter	35¢25
Heel	35¢25
Rein	35¢25
Stallion	35¢25
Covert Saddle	70¢
Breast	70¢
Halter	70¢
Mold Back	70¢
Rein	70¢

Wire Goods Co.—

Am. C. M. and Halters	10¢45 45¢10
Am. Cow Ties	45¢10 45¢10
Eureka Coll and Halters	45¢10 45¢10
Niagara Coll and Halters	45¢10 45¢10
Niagara Cow Ties	45¢10 45¢10
Wire Dog Chains	45¢10 45¢10

Wire Goods Co.—

Dog Chain	60¢10
Universal Disjointed Chain	50¢
Chalk (From Jobbers.)	
Carpenter's Blue	gro. 42¢50
Carpenter's Red	gro. 37¢50
Carpenter's White	gro. 33¢50

Chalk Lines—See Lines.**Checks, Door—**

Larley's	40¢10
Columbia	50¢10
Ellipse	60¢10 60¢10

Chests, Tool—

American Tool Chest Co.	
Boys' Chests, with Tools	55¢
Youths' Chests, with Tools	40¢
Gentlemen's Chests, with Tools	30¢
Farmers', Carpenters', etc., Chests,	25¢
with Tools	25¢
Machinists' and Pipe Fitters' Chests,	50¢
Empty	50¢
C. E. Jennings & Co.'s Machinists' Tool	30¢
Chests	30¢

Chisels—

Socket Framing and Firmer	
Standard List	70¢55 70¢10
Buck Bros	30¢
Charles Buck	30¢
C. E. Jennings & Co. Socket Firmer	60¢10
No. 10	60¢10
C. E. Jennings & Co. Socket Framing	70¢55
No. 15	60¢10
Swan's	45¢10 50¢10
L. & J. White	30¢30 30¢55

Tanged—

Tanged Firmers	40¢55 40¢10
Back Bros	30¢
Charles Buck	30¢
C. E. Jennings & Co. No. 191, 181,	25¢
L. & J. White, Tanged	25¢55

Cold—

Cold Chisels, good quality, lb.	13¢15
Cold Chisels, fair quality, lb.	11¢12
Cold Chisels, ordinary, lb.	8¢30

Chucks—

Beach Pat., each \$5.00	20¢
Mussey's Planer and Milling	15¢25
Skinner Patent Chucks	
Combination Lathe Chucks	40¢
Drill Chucks, Patent and Standard	20¢
Drill Chucks, New Model	25¢
Independent Lathe Chucks	40¢
Improved Planer Chucks	25¢
Universal Lathe Chucks	40¢
Face Plate Jaws	40¢
Standard Tool Co.	
Improved Drill Chuck	43¢
Union Mfg. Co.	
Combination	40¢
C. M. Drill	30¢
Geared Scroll	30¢
Independent	40¢
Union Drill	30¢
Universal	40¢
Face Plate Jaws	35¢

Clamps—

Adjustable, Hammer's	20¢40 25¢
Cabinet Sargent's	50¢10

Carriage Makers', P. S. & W. Co. 40&10	
Carriage Makers' Sargent's	50&10
Boys, Parallel	33&10
Lineman's, Ulica Drop Forge & Tool	40¢

Saw Clamps, see Vices, Saw Filers.**Cleaners Sidewalk—**

Star Socket, All Steel	per doz. \$4.00 net
Star Shank, All Steel	per doz. \$3.75 net
W. & C. Shank, All Steel, 7 1/2 in.	per doz., \$3.05; 8 in., \$3.10; 8 1/2 in., \$3.25.

Cleavers, Butchers'—

Foster Bros, 15	30¢
New Haven Edge Tool Co.	40¢
Fayette R. Plumb	33&10 33&10
P. S. & W.	50¢50 50¢55
L. & J. White	25¢

Clippers—

Chicago Flexible Shaft Company	
Handy Toilet	per doz. \$7.90
Mascotte Toilet	per doz. \$4.40
Monte Toilet	per doz. \$9.00
Stewart's Toilet	per doz. \$10.00

Clips Axle—

Eagle and Superior 1/4 and 5/16	70¢10
inch	70¢10
Norway, 1/4 and 5/16 inch	70¢10

Cloth and Netting, Wire—**See Wire, Ar.****Cocks, Brass—****Hardware list:**

Compression and Plain Bibbs	65¢50 65¢10
Globe, Kerosene, Racking, etc.	65¢10 65¢10
Cocks	65¢10 65¢10

Coffee Mills—See Mills, Coffee.**Collars Dog—**

Brass, Pope & Stevens' list	40¢
Embossed Gilt, Pope & Stevens' list	30¢10
Leather, Pope & Stevens' list	40¢

Compasses Dividers, &c.—

Ordinary Goods	75¢75 75¢75
Bemis & Call Hdw. & Tool Co.	
Dividers	65¢
Callipers, Call's Patent Inside	65¢
Callipers, Double	65¢
Callipers, Inside or Outside	65¢
Callipers, Wing	60¢
Compasses	50¢
J. Stevens A. & T. Co.	25¢10

Compressors Corn Shock—**Conductor Pipe, Calva.—****L. C. L. to Dealers: Noted.**

Territory. Not noted.	
Eastern	70¢10 70¢10
Central	70¢10 70¢10
Southern	65¢10 65¢10
S. Western	60¢10 60¢10
Terms, 2 1/2 for cash.	
Jobbers receive extra 12 1/2% on car-	
loads base, and extra 12 1/2% on car-	
loads crated.	

See also Eave Troughs.**Coolers, Water—**

Gal. each	3 4 8
Labrador \$1.20 \$1.50 \$1.80 \$2.10 2.20	
Gal.	2 3 4 6 8
Iceland, ea. \$1.80 \$2.10 \$2.40 \$3.00	
Gal.	2 3 4 6 8
Galv. Lined Ea. \$1.85 \$2.00 \$2.25 \$2.90 \$3.90	

Gay, Lined side handles

Each, \$1.35 \$2.15 \$2.40 \$3.30 \$4.15, 25¢	
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Coopers' Tools—**See Tools, Coopers.****Cord—Sash—**

Braided, Drab	lb. 25
Braided, White, Common	lb. 17 1/2
Cable Laid Italian	lb. 4; 5; 6; 8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50; 52; 54; 56; 58; 60; 62; 64; 66; 68; 70; 72; 74; 76; 78; 80; 82; 84; 86; 88; 90; 92; 94; 96; 98; 100
Common India	lb. 2 60 1/2
Cotton Sash Cord, Twisted	17 1/2 lb.
Patent Russia	lb. 1 3/4 6 1/2
Cable Laid Russian	lb. 1 3/4 6 1/2
India Hemp, Braided	lb. 1 3/4 6 1/2
India Hemp, Twisted	lb. 1 3/4 6 1/2
Patent India, Twisted	lb. 1 3/4 6 1/2
Pearl Braided, cotton	lb. 2 1/2 17 1/2
Massachusetts, White	lb. 2 1/2 17 1/2
Massachusetts, D. ab.	lb. 2 1/2 17 1/2
Eddystone Braided Cotton	lb. 2 1/2 17 1/2
Harmony Cable Laid Italian	lb. 2 1/2 17 1/2
Ossawatimie Mills	lb. 2 1/2 17 1/2

Crown, Solid Braided White

Peerless	lb. 2 1/2 17 1/2
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Cable Laid Italian

Cable Laid Russian	lb. 1 3/4 6 1/2
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Braided India

Phoenix, White	lb. 1 3/4 6 1/2
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Samson, Nos. 7 to 12:

Braided, Drab Cotton	lb. 2 1/2 17 1/2
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Braided, Italian Hemp

Braided, Linen	lb. 2 1/2 17 1/2
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Braided, White Cotton, Spot

No. 6, extra	lb. 2 1/2 17 1/2
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Silver Lake:

A quality, Drab, 40¢	15¢
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B quality, White, 35¢

B quality, Drab, 35¢	15¢
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B quality, White, 30¢

Italian Hemp, 40¢	15¢
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Linen, 37¢**Wire, Picture—****Noted.****Note.—There is a good deal of confusion****in lists, some using old list and others the****new list.****Corn Knives and Cutters—****See Knives, Corn.****Corn Planters—****See Planters, Corn—****Crackers, Nut—**

Little Giant	per gr. \$24.00
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Crads—**Crays—****White Round Crays, gross, 5 1/2 @ 60¢****Crays, 10¢ gro., \$1.50, at factory.****D. M. Steward Mfg. Co.****Metal Workers' Crays, round, flat****or square****Rolling Mill Crays, round, flat****Rolling Mill Crays, round, flat****Rolling Mill Crays, round, flat****Rolling Mill Crays, round, flat****Rolling Mill Crays, round, flat****Rolling Mill Crays, round, flat****Rolling Mill Crays, round, flat****Fort Madison, Light****Crow Bars—See Bars, Crow.****Cultivators—****Victor Garden****Cutlery, Table—**

International Silver Company:	
No. 12 Medium Knives, 18 1/2 in.	per doz. \$3.50
Star, Eagle, Rogers & Hamilton and	
Anchor	per doz. \$3.00
Wm. Rogers & Son	per doz. \$2.50
Simon L. & Geo. H. Rogers Company:	
12 dw. Medium Knives	per doz. \$3.00
No. 7 Medium Knives	per doz. \$2.50

Cutters—Glass—

H. H. Mayhew Co.	40¢
Smith & Hemenway Co.	50¢

Meat—

Hale's, Nos. 11 1/2 12 1/2 13 1/2 14 1/2	
Per doz.	\$2.50 2.50 2.50 2.50
American	40¢
Each	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Each	\$7 \$10 \$25 \$50 \$80

Connecticut

No. 20 40 60 8 10 12	
Each	\$1.75 2.00 2.25 2.50 3.00 4.00

Enterprise

No. 5 10 12 22 32	
Each	\$3 \$3 \$2.50 \$2 \$2

Dixon's

No. 1 2 3 4	
Each	\$14.00 \$17.00 \$19.00 \$30.00

Home No. 1

Each	\$22.75 50¢10 50¢10
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Little Giant

Each	\$3.00 3.00 3.00 3.00
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\$35.00 \$48.00 \$44.00 \$74.00 \$68.00**Sterling**

No. 1 2	
Each	\$2.00 \$2.50

New Triumph No. 605

Each	\$24.00 30¢10 30¢10
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Woodruff's

No. 1 2 3 4	
Each	\$15.00 \$18.00 \$20.00 \$25.00

Chadborn's Smoked Beef Cutter

Each	\$60.00
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Enterprise Beef Shavers

Ladies—Melting—

L. & W. Mfg. Co. 25¢
P. S. & W. 50¢
Reading 50¢
Sargent & Co. 10¢

Lanterns—Tubular—

Regular 1 molar 50¢
Left 1 molar 50¢
Hinge 1 molar 50¢
Other styles 50¢

Bull's Eye Police—

No. 1, 2 1/2 inch 50¢
No. 2, 3 inch 50¢

Latches, Thumb—

Roggen's Latches 50¢

Lawn Mowers—

See Mowers, Lawn.

Leaders Cattle—

Small 50¢; large, 55¢

Lemon Squeezers—

See Squeezers, Lemon.

Lifters, Transom—

Solid grip, Payson Mfg. Co. 50¢

Lines—

Wire Cloth, Nos. 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Locks—Cabinet—

Cabinet Locks 50¢

Door Locks, Latches, &c.—

[Not prices are very often made on these goods.]

Reading Hardware Co.—

R. & E. Mfg. Co. 50¢

Sargent & Co.—

Stowell's 40¢

Elevator—

Stowell's 40¢

Padlocks—

Wrought Iron 50¢

Sash, &c.—

Fitch's 60¢

Iron—

Iron 50¢

Wrought Iron—

Wrought Iron 50¢

Payson Mfg. Co.—

Payson Mfg. Co. 50¢

Machines—Boring—

Common, Upright, Without Augers, 50¢

Common, Angular, Without Augers, 50¢**Without Augers, 50¢****Improved No. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 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609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000****Moore's Anti-Friction Differential Pulley Block, 30¢****Moore's Hand Hoist, with Lock Brake, 20¢****Moore's Portable Pneumatic Hoist, 25¢****Ice Cutting—**

Chandler's 15¢

Washing—

Wayne American 50¢

Maillets—

Hickory 50¢

Mats—Door—

Elastic Steel (W. G. Co.) 10¢

Mattocks—

See Picks and Matto

Shovels and Spades—
Association list, March, 1902..... 407

Sieves and Sifters—
Hunter's, imitation, gro. \$11.00 @ 11.50
 Buffalo Metallic Sifted, S. S. & Co., per gr.:
 14x16 10x15 1x20
 \$12.90 \$13.80 \$15.00
 F. J. Meyers' Mfg. Co.:
 Ellipse, per gr. \$11.00
 Electric Light, per gr. \$11.00
 Hunter's genuine, per gr. \$12.50
 No Name, Hunter's, per gr. \$11.00
 Standard, per gr. \$11.00
 Shaker (Barber's Pat.) Flour Sifters, 40¢
 per doz., \$2.00

Sieves, Tin Rim—
 Per dozen
 Mesh 14 16 18 20
 Black, full size, \$0.95 .98 1.00 1.10
 Plated, full size, \$1.05 1.08 1.10 1.20
 Black, scant, \$0.78 .80 .83

Sieves, Wooden Rim—
 Nested, 10, 1, and 12 Inch.
 Mesh 18, Nested, doz. \$0.55 @ 0.75
 Mesh 20, Nested, doz. .75 @ .85
 Mesh 24, Nested, doz. .90 @ 1.00

Sinks—
Cast Iron—
 Standard list 65¢ @ 70¢
 Note—There is not entire uniformity
 lists used by jobbers.

Wrought Steel—
 New Era, Galv'd and Enamelled, 70¢ @ 75¢
 New Era, Painted, 50¢ @ 101¢
 L. & G. Mfg. Co., Galvanized, 50¢
 L. & G. Mfg. Co., Enamelled, 50¢

Sinks, Wagon—
 Cast Iron, 70¢ @ 100¢
 Malleable Iron, 100¢ @ 105¢
 Steel, 100¢ @ 105¢

Slates—
 Factory Shipments.
 "D" Slates, 50¢ @ 100¢
 Unexcelled, etc., Noiseless Slates, 60¢ @ 80¢
 Victoria, etc., Noiseless Slates, 70¢ @ 85¢
 Wire Bound, 70¢ @ 85¢
 Web Hinge, 50¢ @ 55¢

Slaw Cutters—See Cutters.
Slicers, Vegetable—
 Sterling \$2.00 .33¢
Snaps, Harness—
 German, 40¢ @ 40¢
 Covert Mfg. Co.:
 Derby, 85¢ @ 85¢
 High Grade, 45¢ @ 45¢
 Jockey, 45¢ @ 45¢
 Troant, 45¢ @ 45¢
 Yankee, 35¢ @ 35¢
 Yankee, Roller, 30¢ @ 30¢

Cover's Sundry Works:
 Crown, 60¢
 German, 60¢
 Molet, 60¢
 Triumph, 60¢
 W. & E. T. Fitch Co.:
 Bristol, 40¢ @ 105¢
 Empire, 50¢ @ 55¢
 German, 40¢ @ 40¢
 National, 50¢ @ 55¢
 Perfect, 40¢ @ 40¢
 Clipper, 50¢ @ 55¢
 Champion, 40¢ @ 40¢
 Security, 40¢ @ 40¢
 Victor, 40¢ @ 40¢
 Oneida Community, 40¢ @ 40¢
 No. 4 Steel, 65¢ @ 65¢
 Solid, 65¢ @ 65¢
 Sargent's Patent Guarded, 65¢ @ 65¢

Snaths—
 See Shears.
Soldering Irons—
 See Irons, Soldering.
Spoke Trimmers—
 See Trimmers, Spoke.
Spoons and Forks—
 Silver Plated—
 Good Quality, 50¢ @ 100¢
 Cheap, 50¢ @ 100¢
 International Silver Co.:
 1847 Rogers Bros. and Rogers & Hamilton, 40¢ @ 105¢
 Rogers & Bro., William Rogers Eagle Brand, 50¢ @ 105¢
 Anchor, Rogers Brand, 60¢ @ 105¢
 Wm. Rogers & Son, 60¢ @ 105¢
 Simon L. & Geo. H. Rogers Co., 60¢ @ 105¢
 Silver Plated Flat Ware, 60¢ @ 105¢
 No. 17 Silver Plated Ware, 60¢ @ 105¢

Miscellaneous—
 German Silver, 60¢ @ 100¢
 Cattaraugus Cutlery Co.:
 Yukon Silver, 50¢
 Simon L. & Geo. H. Rogers Co.:
 German or Nickel Silver, Special Hist. 1¢ @ 10¢

Tinned Iron—
 Teas, per gro. 45¢ @ 50¢
 Tables, per gro. 90¢ @ 100¢

Springs—
Door—
 Gem (Coll), 20¢
 Star (Coll), 20¢
 Torrey's Tool, 39 in., per doz. \$1.10 @ 1.25
 Victor (Coll), 50¢ @ 105¢

Carriage, Wagon, &c.
 24 in. and wider:
 Black or 1/2 Bright, lb., 44¢
 Bright, lb., 54¢
 Painted Seat Springs:
 1 1/2 x 2 1/2 and smaller, per pr. 45¢ @ 53¢
 1 1/2 x 2 1/2, per pr. 50¢ @ 61¢
 1 1/2 x 3 1/2 and narrower, per pr. 70¢ @ 80¢

Cliff's Springs:
 Bolster, 40¢
 Seat, per pair, 50¢
 Pole, per pair, 40¢ @ 1.10, 1.15

Sprinklers, Lawn—
 Enterprise, 25¢ @ 29¢
 Philadelphia No. 1, per doz. \$12; No. 2, \$15; No. 3, \$24.

Squares
 Nickel plated, List Jan. 5, 1902
 Steel and Iron, 75¢ @ 75¢
 Rosewood rail, Try Square and T-Bevels, 50¢ @ 100¢

Iron Hll. Try Squares and T-Bevels.
 List Jan. 5, 1902
 Danton's Try Sq. and T-Bevels, 50¢ @ 100¢
 Winterbottom's Try and Miter, 50¢ @ 100¢

Squeezers—
Lemon—
 Wood, Common, gro., No. 9, 55¢ @ 55¢
 @ \$5.59; No. 1, 55¢ @ 55¢
 Wood, Porcelain Lined:
 Cheap, doz. \$2.00 @ 2.75
 Good Grade, doz. \$3.00 @ 3.50
 Tinned Iron, doz. \$0.75 @ 1.35
 Iron, Porcelain Lined doz. \$2.90 @ 3.25
 Jennings' Star, per doz. \$1.85 @ 1.90

Staples—
 Barbed Blind, lb. 60¢ @ 65¢
 Electricians', Association list, 50¢ @ 100¢
 Fence Staples, same price as Barbed Wire, See Trade Report.
 Poultry Netting, Staples, per lb. 31¢ @ 34¢

Grand Crossing Tack Co.'s list, 80¢ @ 100¢
Steels, Butchers'—
 Dick's, 30¢
 Foster Bros., 30¢
 Hartzell Cutlery Co., 30¢
 C. & A. Hoffmann's, 40¢

Steelyards—
 25¢ @ 25¢
Stocks and Dies—
 Blacksmiths', 100¢ @ 100¢
 Gardner Die Stocks, No. 1, 50¢
 Gard. er Die Stocks, larger sizes, 40¢
 Green River, 25¢
 Lightning Screw Plate, 25¢
 Little Giant, 25¢
 Re. co's New Screw Plates, 25¢ @ 30¢
 Curtis Reversible Hatchet Die Stock, 25¢

Stone—
Savthe Stones—
 Chicago Wheel & Mfg. Co.:
 Gem Corundum, 10 inch, \$3.00 per gro., 12 inch, \$10.00
 Pike Mfg. Co. 1901 list:
 Black Diamond S. S., per gro. \$12.00
 Lamolite S., per gro. \$11.00
 White Mountain S. S., per gro. \$9.00
 Green Mountain S. S., per gro. \$6.00
 Extra Indian Pond S. S., per gro. \$7.50
 No. 1 Indian Pond S. S., per gro. \$7.00
 No. 2 Indian Pond S. S., per gro. \$4.50
 Leader and End S. S., per gro. \$4.50
 Balance of 1901 list 35¢

Chicago Wheel & Mfg. Co. 1901 list:
 Gem Corundum Oil, Double Grit, 50¢
 Gem Corundum Oil, single or Double Grit, 50¢
 Gem Corundum Slips, 50¢
 Gem Corundum Razor Hones, 50¢
 Pike Mfg. Co. 1901 list:
 Arkansas Stone, No. 1, 30¢ @ 35¢
 Arkansas Stone, No. 1, 30¢ @ 35¢
 Arkansas Slips, No. 1, 100¢
 Lily White Washita, 4 to 8 in., 60¢
 Rosy Red Washita, 4 to 8 in., 60¢
 Washita Stone, Extra, 4 to 8 in., 50¢
 Washita Stone, No. 1, 4 to 8 in., 40¢
 Washita Stone, No. 2, 4 to 8 in., 30¢
 Lily White Slips, 90¢
 Rosy Red Slips, 90¢
 Washita Slips, Extra, 80¢
 Washita Slips, No. 1, 70¢
 India Oil Stones (entire list), 25¢
 Hindostan No. 1, Regular, 10¢ @ 10¢
 Hindostan No. 1, Small, 10¢ @ 10¢
 Axe Stones (all kinds), 30¢ @ 30¢
 Turkey Oil Stones, ex. 5 to 10 in., 30¢
 Queer Creek Slips, 40¢
 Sand Stone, 50¢
 Belgian, German and Swaty Razor Hones, 40¢
 Natural Grit Carving Knife Hones, 30¢
 Quick Edge Pocket Knife Hones, 30¢
 Mounted Kitchen Sand Stone, 10¢
 Tanite Mills:
 Emery Oil, per doz. \$5.00, 50¢ @ 60¢

Stones—
Cherry—
 Enterprise, 25¢ @ 30¢
Stops, Bench—
 Millers Falls, 15¢ @ 105¢
 McMill's, per doz. No. 1, \$10.00
 McMill's, No. 2, \$12.50
Stops, Window—
 Ives' Patent, 25¢ @ 35¢
Stove Boards—
 See Boards, Stove.
Stove Polish—See Polish, Stove.
Strainers, Pump—
 Diamond Joe Pump Strainers, per doz. 75¢
Straps, Box—
 Cary's Universal, case lots, 20¢ @ 105¢
Stretchers, Carpet—
 Cast Iron, Steel Points, doz. 55¢ @ 65¢
 Socket, doz. \$1.75
Strops, Razor—
 Smith & Hemenway Co., 70¢
Stuffers, Sausage—
 Enterprise Mfg. Co., 25¢ @ 25¢
 National Specialty Mfg. Co., list Jan. 1, 1902, 30¢

Tacks Brads, &c.—
 List Jan. 15, '99.
 Carpet Tacks, American 90¢ @ 25¢
 American Cut Tacks, 90¢ @ 20¢
 Swedes Iron Tacks, 90¢ @ 20¢
 Swedes Upholsterers' Tacks, 90¢ @ 20¢
 Gimp Tacks, 90¢ @ 20¢
 Lace Tacks, 90¢ @ 20¢
 Trimmers' Tacks, 90¢ @ 25¢
 Looking Glass Tacks, 70¢ @ 105¢
 Bill Posters' and Railroad Tack, 90¢ @ 20¢
 Hungarian Nails, 80¢ @ 15¢
 Common and Patent Brads, 80¢ @ 105¢
 Trunk and Mount Nails, 80¢ @ 5¢

NOTE—The above prices are for straight weights.* An extra 5% is given for Star Weights and an extra 10% on Standard Weights.*****
Miscellaneous—
 Double Point Tacks, 90¢ @ 70¢
 Steel Wire Brads, R. & E. Mfg. Co.'s list, 50¢ @ 100¢
 See also Nails, Wire.

Tanks, Oil—
 Emerald, S. S. & Co., 30-gal. \$3.20
 Emerald, S. S. & Co., 60-gal. \$4.00
 Queen City S. S. & Co., 50-gal. \$3.50
 Queen City S. S. & Co., 80-gal. \$4.25

Tapos, Measuring—
 American Asses' Skin, 40¢ @ 100¢
 Patent Leather, 25¢ @ 50¢
 Steel, 100¢ @ 100¢
 Chesterman's, 25¢ @ 50¢
 Eddy's Steel, 40¢ @ 100¢
 Eddy's Metallic, 35¢ @ 100¢
 Kenell & Esser Co., Steel and Metallic Lower list, 1899, 35¢
 Lufkin's Steel, 35¢ @ 35¢
 Lufkin's Metallic, 30¢ @ 30¢

Teeth Harrow—
 Steel Harrow Teeth, plain or head-ed, base per lb. 24¢
Thermometers—
 Tia Case, 80¢ @ 100¢
Ties, Bale—Steel.
 Single Loop, 75¢
 Other Styles, 70¢

Ties, Wall—
 Cleveland Wire Splicing Co.:
 Galv. Steel 5-32 x 6 1/2 in. 6 1000 \$10.00
 Galv. Steel 5-32 x 8 1/2 in. 6 1000 \$11.00
 Galv. Steel 5-32 x 11 1/2 in. 6 1000 \$12.00
 Galv. Steel 5-32 x 15 1/2 in. 6 1000 \$14.00

Tinners' Shears, &c.—
 See Shears, Tinners', &c.
Tinware—
 Stamped, Japanned and Placed, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.
Tobacco Cutters—
 See Cutters, Tobacco.

Tools—
Coopers'—
 L. & I. J. White, 20¢ @ 20¢
Saw—
 Atkins' Cross Cut Saw Tools, 40¢
 Simonds' Improved, 35¢
 Simonds' Crescent, 25¢
 L. & I. J. White, 25¢

Transom Lifters—
 See Lifters, Transom.
Traps—
Fly—
 Balloon, Globe or Acme, 100¢
 doz. \$1.15 @ 1.25; gro. \$11.50 @ 12.00
 Harper, Champion or Paragon, 100¢
 doz. \$1.25 @ 1.40; gro. \$13.00 @ 13.50

Game—
 Oneida Pattern, 75¢ @ 100¢
 Newhouse, 45¢ @ 45¢
 Hawley & Norton, 65¢ @ 65¢
 Victor (Oneida Pattern), 75¢ @ 75¢
 Star (Blake Pattern), 60¢ @ 60¢

Mouse and Rat—
 Mouse, Wood, Choker, doz. holes, 8 1/2 @ 9¢
 Mouse, Round or Square Wire, doz. \$0.85 @ 1.00
 American Pattern French Rat and Mouse Traps:
 No. 1, Detroit, Marty Pattern, per doz. \$4.50; in to gro. lots, per doz. \$4.00
 No. 2, Detroit, Marty Pattern, per doz. \$4.25; in to gro. lots, per doz. \$3.90
 Detroit Marty Pattern Mouse, per doz. \$2.00; in to gro. lots, per doz. \$1.75
 Diamond Joe Mouse Traps, per doz. 60¢
 Diamond Joe Rat Traps, per doz. \$1.00
 Marty French Rat and Mouse Traps (Genuine):
 No. 1, Rat, Each \$1.12 1/2; per doz. \$12.00
 No. 3, Rat, per doz. \$6.00; case of 50 \$3.25 doz.
 No. 3 1/2, Rat, per doz. \$4.75; case of 72 \$1.25 doz.
 No. 4, Mouse, per doz. \$3.50; case of 72 \$2.75 doz.
 No. 5, Mouse, per doz. \$2.75; case of 150 \$2.25
 Schuyler's Rat Killer, No. 1, per gr. \$30.00; No. 2, per gr. \$30.00; Mouse, No. 3, \$18.00

Target—
 Markle's, each, 75¢ @ 50¢
Trimmers, Spoke—
 Bonney's Nos. 1 and 2, 40¢

Trowels—
 Danton Brick and Pointing, 50¢
 Danton Plastering, 25¢
 Danton Standard Brand and Galv'd Trowels, 40¢
 Never-Break Steel Garden Trowels, 70¢
 Peace's Plastering, 70¢
 Rose Brick and Plastering, 25¢
 Woodrough & McFarlin, Plastering, 25¢

Trucks, Warehouse, &c.—
 B. & L. Block Co.'s list, 50¢
 Daisy Stove Trucks, Improved pattern, per doz. \$18.50
 Model Stove Trucks, per doz. \$18.50

Tubs, Wash—
 No. 1 2 3
 Galvanized, per doz. \$5.00 5.50 6.00
 Galvanized Wash Tubs (S. S. & Co.):
 No. 1 2 3 10 20 30
 Per doz. \$5.25 6.00 6.75 6.50 7.25 8.00

Twine—
Miscellaneous—
 No. 9, 1/4 and 1/2-lb. Balls, 22¢ 24¢
 No. 12, 1/4 and 1/2-lb. balls, 18¢ 20¢
 No. 18, 1/4 and 1/2-lb. Balls, 16¢ 18¢
 No. 24, 1/4 and 1/2-lb. Balls, 15¢ 17¢
 No. 36, 1/4 and 1/2-lb. Balls, 15¢ 17¢

Chalk Line, Cotton, 1/4-lb. Balls, 22¢ @ 22 1/2¢
Cotton Mops, 6, 9, 12 and 15 lb., to doz. 7¢ @ 8¢
Cotton Wrapping, 5 Balls to lb. according to quality, 10¢ @ 17¢
American 2-Ply Hemp, 1/4 and 1/2-lb. Balls, 15¢ @ 16¢
American 3-Ply Hemp, 1-lb. Balls, 13¢ @ 14¢
India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine), 8¢
India 3-Ply Hemp, 1-lb. Balls, 8¢
India 3-Ply Hemp, 1 1/2-lb. Balls, 7¢
2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls, 9¢ @ 10¢

Mason Line, Linen, 1/4-lb. Balls, 15¢
No. 26 Mattress, 1/4 and 1/2-lb. Balls, 37¢
Wool, 3 to 6 ply, 50¢ @ 50¢

Vises—
 Solid Box, 50¢ @ 50¢ @ 100¢

Parallel—
 Athol Machine Co.:
 Simpson's Adjustable, 40¢
 Standard, 40¢
 Amateur, 25¢
 Bonney's, 40¢
 Columbian Hdw. Co., 40¢
 Fisher & Norris Double Screw, 15¢ @ 105¢
 Hollands', 40¢
 MacL. nists', 40¢
 Key-tone, 65¢ @ 75¢
 Lewis Tool Co., 20¢ @ 25¢
 Massey's Perfect, 15¢ @ 20¢
 Massey's, 20¢
 Clincher, 80¢ @ 40¢
 Combination, Quick Adj., 40¢
 Woodworker's, 15¢ @ 20¢
 Merrill's, 20¢
 Miller's Falls, 50¢ @ 100¢
 Parker's:
 Victor, 20¢ @ 25¢
 Regulars, 20¢ @ 25¢
 Vulcan's, 40¢ @ 45¢
 Combination Pipe, 45¢ @ 40¢
 Prentiss, 20¢ @ 25¢
 Sargent's, 40¢
 Smolker's X. L., 20¢ @ 25¢
 Stephens', 20¢ @ 25¢

Saw Fillers—
 Bonney's, No. 1, \$1.15; No. 3, \$1.16, 50¢ @ 80¢
 Danton's D 3 Clamp and Guide, per doz. \$30
 Reading, 60¢
 Wentworth's Rubber Jaw, Nos. 1, 2 and 3, 45¢ @ 50¢

Miscellaneous—
 Bignall & Keeler Combination Pipe Vise, 40¢
 Parker's Combination Pipe: 67 Series, 60¢
 187 Series, 60¢ @ 65¢
 No. 870, 40¢

Wads—Price Per M.
 B. E., 11 up, 60¢
 B. E., 9 and 10, 70¢
 B. E., 8, 80¢
 B. E., 7, 80¢
 P. E., 11 up, \$1.00
 P. E., 9 and 10, 1.25
 P. E., 8, 1.50
 P. E., 7, 1.50
 Ely's B. E., 11 and larger, \$1.00 @ 1.15
 Ely's P. E., 12 to 20, \$3.00 @ 3.25

Wagon Jacks—
 See Jacks, Wagon.

Ware, Hollow—
 Aluminum—
 S. S. & Co. Reduced List, 40¢
Cast Iron, Hollow—
 Store Hollow Ware:
 Ground, 65¢
 Unground, 70¢
 White Enamelled Ware:
 Maslin Kettles, 75¢ @ 100¢ @ 80¢
 Covered Ware:
 Tinned and Turned, 40¢ @ 100¢ @ 100¢
 Enamelled and Platin, 50¢ @ 50¢ @ 100¢
 See also Pots, Glue.

Enamelled—
 Agate Nickel Steel Ware, list Nov. 1, 01, 50¢ @ 30¢
 Iron Clad Ware, 70¢ @ 100¢
 Never Break Enamelled, 50¢ @ 50¢ @ 100¢

Tea Kettles—
 Galvanized Tea Kettles:
 Inch, 6 7 8 9
 Each, 1.50 50¢ 55¢ 65¢
Steel Hollow Ware.
 Avery Spiders & Griddles, 65¢ @ 65¢
 Avery Kettles, 60¢
 Porcelain, 50¢ @ 50¢ @ 100¢
 Never Break Spiders and Griddles, 60¢
 Never Break Kettles, 60¢
 Solid Steel Spiders & Griddles, 65¢ @ 5¢
 Solid Steel Kettles, 60¢
 Solid Steel Ware, Enamelled, 50¢ @ 5¢

Washboards—
 Solid Zinc:
 Crescent, family size, bent frame, \$3.00
 Red Star, family size, stationary protector, \$1.00
 Double Zinc Surface:
 Saginaw Globe family size, stationary protector, \$2.65
 Cable Cross, family size, stationary protector, \$2.90
 Single Zinc Surface:
 Alad, family size, open back perforated, \$2.40
 Saginaw lobe, protector, family size, ventilated back, \$2.25

Combination Bright.....	40c
Cylinder or Gas Pipe.....	55c
Extra Heavy.....	45c
Morris'.....	50c
No. 3 Pipe, Bright.....	55c
Bindley Automatic.....	30c
Roariman's.....	33 1/2c
Coe's genuine.....	40c 10c 5c 5c
Coe's Mechanics'.....	40c 10c 10c 5c 5c
Deane's Engineer.....	40c 10c
Eagle.....	50c 10c
Elgin Wrench.....	30c
Eliz N Monkey Wrench Pipe Jaws.....	30c
Gem Pocket.....	30c
Hercules.....	70c
Knife Handle, Machinists' (W. & B.).....	50c
Case Ints.....	50c 10c
Improved Pipe (W. & B.).....	50c 10c
Solid Handles, P. S. & W.....	50c 5c 10c
S. H. H. n.....	65c
Triumph.....	60c 10c
Violet Chan.....	50c
Wrought Goods-	
Staples, Hooks, &c., list March 17 '92.....	50c 10c
Yokes Neck-	
Covert Sadlery Works, Trimme 1.60 &c.	
Covert Saddlery Works, Neck Yoke.....	70c
Yokes, Ox, and Ox Bows-	
Fort Madison's Farmers & Freighters'.....	list next
Zinc-	
Sheet.....	lb 65c @ &c

Remittances should be made by draft, payable to the order of DAVID WILLIAMS COMPANY, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

Newsagents or Booksellers in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.; The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, NEW YORK, as Second-class Matter.

MARCH 19, 1902.

Dealers' Prebasing Prices Paid in New York.		
Heavy Copper.....		\$ 109 1/2
Light and Tinned Copper.....		" 9 1/2
Heavy Brass.....		" 8 1/2
Light Brass.....		" 6 1/2
Lead.....		" 35 1/2
Tea Lead.....		" 35 1/2
Zinc.....		" 15 1/2
No. 2 Pewter.....		" 8 1/2
Pure Aluminum, Sheet, # 10.....		" 25 1/2
Cast Aluminum, # 10.....		" 24 1/2
1 in Plate Iron.....	per ton	\$ 5.00
Wrought Scrap Iron.....	per gross ton	\$ 11.50-14.00
Heavy Cast Scrap.....	per gross ton	\$ 12.50-14.00
Stove Plate Scrap.....	per gross ton	\$ 8.50-10.00
Burnt Iron.....	per gross ton	\$ 7.00-7.50